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Using animated videos and prompt delay procedures to train children with autism to label situation-based emotions

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By

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Research has indicated that individuals with ASD have deficits in the ability to correctly identify and interpret the emotions and feelings of others. The ability to recognize the emotions of others has shown to be extremely beneficial in a number of ways. On the other hand, the inability to recognize the emotions of others has been linked to a number of negative outcomes, including inappropriate behaviors, as well as mental health, personal, social, and academic difficulties. The purpose of the current study was to extend the previous literature on effective strategies for teaching individuals with ASD to correctly label the situation-based emotions of others. Overall, the current study's results suggest that an intervention package combining animated videos with prompt delay, error correction, and reinforcement procedures was effective in teaching participants the ability to label situation-specific emotions. Additionally, the current study's results also supported the idea that individuals with ASD have stronger deficits in recognizing negative emotions, such as sad, mad, and afraid, as compared to positive emotions, such as happy. Future research should continue to focus on exploring the generalization and maintenance of these results.

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CHAPTER I

INTRODUCTION

Autism Spectrum Disorder (ASD) is an early onset disorder characterized by persistent deficits in social communication and social interaction, as well as restricted, repetitive patterns of behavior, interests, or activities (American Psychiatric Association [APA], 2013). There are several key diagnostic markers of ASD, including social communication deficits, reflecting difficulties with the natural give-and-take of social interactions (i.e., social reciprocity); difficulties in understanding and exhibiting nonverbal communication behaviors (e.g., eye contact, gestures, facial expressions, and nonverbal social cues); and deficits in building, sustaining, and understanding social relationships (Ahlers, Gabrielsen, Lewis, Brady, & Litchford, 2017).

Social deficits are known as the cornerstone of ASD, both defining and distinguishing ASD from other developmental disorders (APA, 2013; Fishman, Keown, Lincoln, Pineda, & Müller, 2014; Ratcliffe, Wong, Dossetor, & Hayes, 2014; Smith, Montagne, Perrett, Gill, & Gallagher, 2010). Appropriate social skills are essential for daily living; however, individuals with ASD typically exhibit substantial challenges with interpreting and participating in social interactions appropriately (Ip et al., 2018; Radley et al., 2017). One main deficit that individuals with ASD often face, and that researchers have theorized could be at the root of many of the social and emotional impairments related to ASD, is the inability to understand emotion (Conallen & Reed, 2016; McKenzie et al., 2018; Schmick, Stanley, & Dixon, 2018; Tanaka et

al., 2012; Uljarevic & Hamilton, 2013). More specifically, individuals with ASD have been shown to have an inability to correctly identify and interpret the emotions and feelings of others (Conallen & Reed, 2016; Baron-Cohen, Golan, & Ashwin, 2009; Fishman et al., 2014; Hobson, Ouston, & Lee, 1989; McKenzie et al., 2018; Schmick et al., 2018; Tanaka et al., 2012; Uljarevic & Hamilton, 2013).

The ability to recognize the emotions of others is extremely beneficial in that it contributes to the development of a large range of social and emotional competencies, such as the ability to form friendships and understand social interactions. This ability to recognize and understand emotions has also been shown to contribute to improving mental health and well-being, increasing future academic success, and reducing externalizing and disruptive behaviors (Conallen & Reed, 2016). On the other hand, the inability to recognize the emotions of others, such as what is seen in individuals with ASD, has been linked to inappropriate behaviors, as well as mental health, personal, social, and academic difficulties (LeBlanc et al., 2003; McHugh, Bobarnac, & Reed, 2011; Ratcliffe et al., 2014; Schmick et al., 2018). Research indicates individuals with ASD show the most apparent deficits for recognizing basic emotions with negative valence, such as fear, disgust, anger, and sadness (Ashwin, Chapman, Colle, & Baron-Cohen, 2006; Humphreys, Minshew, Leonard, & Behrmann, 2007). Additionally, research also indicates that individuals with ASD are better at recognizing simple emotions related to external situations as opposed to recognizing more complex emotions related to internal cognition (Ashwin et al., 2006; Humphreys et al., 2007; Lacroix, Guidetti, Rogé, & Reilly, 2009).

Several theories have been proposed to explain the emotion recognition deficits of individuals with ASD. One biological explanation includes a dysfunction in the brain's Mirror Neuron System, because this area of the brain is responsible for an individual's ability to

understand the meaning of actions, emotions, and experiences of others by internally stimulating and replicating them (Fishman et al., 2014; Ha, Sohn, Kim, Sim, & Cheon, 2015; Hadjikhani, Joseph, Snyder, & Tager-Flusberg, 2006; Wadsworth, Maximo, Donnelly, & Kana, 2018). Another biological explanation includes a dysfunction in the brain's amygdala, because this structure in the brain is primarily responsible for the processing and memory of emotional reactions, including the assessment of the emotional salience of facial expressions (Ashwin et al., 2006; Herrington, Miller, Pandey, & Schultz, 2016; Piggot et al., 2004; Richard et al., 2015). Further, cognitive theorists have suggested a deficit in Theory of Mind (ToM) causes the social and emotional deficits in individuals with ASD, as one's ToM involves the ability to attribute mental states and emotions in others (Baron-Cohen, 1995; Baron-Cohen, Spitz, & Cross, 1993; Ben-Itzchak, Abutbul, Bela, Shai, & Zachor, 2016; Bushwick, 2001).

The ability of individuals with ASD to understand emotions has primarily been examined through their ability to recognize different types of emotions in facial expressions using emotion labeling or matching emotions to visual stimuli (Ben-Itzchak et al., 2016; Uljarevic & Hamilton, 2013). Baron-Cohen, Leslie, and Frith (1985) identified recognizing and labeling situation-specific emotions and/or feelings as a key problem area for children with ASD. Several applied behavior analytic strategies have been suggested in previous literature as effective ways to teach the recognition and labeling of situation-based emotions. Included in these strategies are prompt delay procedures, such as the constant time delay procedure, and video-based discrimination training. Three recent research studies have explored specific techniques and combinations of techniques to teach children with ASD the ability to label situation-based emotions, including prompt delay procedures, video-based interventions, error correction procedures, reinforcement

procedures, stimulus equivalence, and multiple-exemplar training (Conallen & Reed, 2016; McHugh et al., 2011; Schmick et al., 2018).

Study Purpose

The purpose of the current study is to extend the previous literature on effective strategies for teaching the ability to label situation-based emotions. The current study aims to do so by exploring a technique combining multiple elements used in previous research studies in order to determine the effectiveness of the combined technique. The combined elements include animated videos depicting the emotions of happy, sad, angry, and afraid, as well as prompt delay procedures, error correction procedures, and reinforcement procedures.

Research Questions

This study seeks to answer the following research questions.

Research Question #1: Does the use of animated videos with constant time delay prompt procedures increase children with ASD's ability to label situation-specific emotions? (Conallen & Reed, 2016; McHugh et al., 2011; Schmick et al., 2018)

Research Question #2: Will using animated videos and systematic prompt delay procedures be more effective in teaching certain emotions? (Ashwin et al., 2006; Humphreys et al., 2007; Lacroix et al., 2009)

CHAPTER II

LITERATURE REVIEW

Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder that has been reported to occur across all racial, ethnic, and socioeconomic groups (APA, 2013; Baio et al., 2018). According to the Centers for Disease Control and Prevention's (CDC) Autism and Developmental Disabilities Monitoring (ADDM) Network, an estimated 1 in 59 children has been identified with ASD in the United States, the highest reported prevalence estimation of ASD to date (Baio et al., 2018). In fact, the CDC's ADDM Network reported that during the decade of 2002 to 2012, the number of ASD diagnoses increased by 121% (Makrygianni, Gena, Katoudi, & Galanis, 2018). Additionally, the global prevalence of ASD outside of the United States has also rapidly and dramatically increase over time (Ahlers et al., 2017; Ha et al., 2015; Makrygianni et al., 2018). ASD is now one of the most prevalent forms of developmental disabilities internationally (Sacrey, Armstrong, Bryson, & Zwaigenbaum, 2014).

Manifestations of ASD vary greatly depending on the severity of symptoms, developmental level, and chronological age; hence the term "spectrum", which was added to the label of Autism in the most recent version of the APA's Diagnostic and Statistical Manual of Mental Disorders (DSM; APA, 2013). Although each individual with a diagnosis of ASD presents uniquely across this spectrum, there are common categories of symptoms that define the core of the disorder (Ahlers et al., 2017). The fifth edition of the DSM (DSM-5) specifies that an ASD diagnosis requires each of five core criteria: (1) persistent deficits in social communication

and social interaction across multiple contexts; (2) restricted, repetitive patterns of behavior, interests, or activities; (3) symptoms are present in the early developmental period; (4) symptoms cause clinically significant impairment in social, occupational, or other important areas of current functioning; and (5) symptoms are not better explained by Intellectual Disability or Global Developmental Delay. The DSM-5 requires the first criterion of persistent deficits in social communication and social interaction to be manifested, currently or historically, by each of the following: (a) deficits in social-emotional reciprocity; (b) deficits in nonverbal communicative behaviors used for social interaction; and (c) deficits in developing, maintaining, and understanding relationships. Additionally, the DSM-5 requires the second criterion of restricted, repetitive patterns of behavior, interests, or activities to be manifested, currently or historically, by at least two of the following: (a) stereotyped or repetitive motor movements, use of objects, or speech; (b) insistence on sameness, inflexible adherence to routines, or ritualized patterns of verbal or nonverbal behavior; (c) highly restricted, fixated interests that are abnormal in intensity or focus; and (d) hyper- or hypo-reactivity to sensory input or unusual interest in sensory aspects of the environment (APA, 2013).

Social Deficits of ASD

Impairments in social interactions are one of the cornerstones and primary features of ASD; these social deficits are both what define ASD and distinguish it from other developmental disorders (APA, 2013; Fishman et al., 2014; Ratcliffe et al., 2014; Smith et al., 2010). Social interaction is defined as a reciprocal process in which all individuals participate in an active process of initiating and responding to social stimuli with peers (Shores, 1987). Social interaction typically starts to emerge at a young age (Ip et al., 2018). According to Fishman et al. (2014), human survival and success depends on one's ability to navigate and thrive in complex

social situations. Therefore, appropriate social interaction skills are of utmost importance and are essential in our daily living (Ip et al., 2018).

However, research has indicated individuals with ASD participate in less social initiations and responses than their typically-developing peers, and these individuals typically exhibit substantial challenges in interpreting social interactions. Because of this, the social interactions of these individuals are often poor in quality and are usually considered inappropriate according to social and cultural norms (Ip et al., 2018; Radley et al., 2017). For example, when individuals with ASD do not follow the general rules of appropriate social interaction, the individual may appear rude or disinterested. The individual with ASD may ask questions that seem awkward or inappropriate, or the individual may impulsively make comments without thinking about how these comments affect others. Also, others may misunderstand what the individual with ASD is trying to convey due to unnatural body movements or facial expressions that do not match the individual's actual feelings (Ahlers et al., 2017). Behaviors such as these are typical in individuals with ASD, and they play a large role in social interaction impairments within ASD.

The social deficits experienced by individuals with ASD impact their ability to successfully interact with same-age peers and adults. This impact results in decreased opportunities to establish friendships and increased subsequent social isolation from peers (Radley et al., 2017). According to the National Longitudinal Transition Study-2012, adolescents with ASD reported lower rates of seeing friends outside of school (29%) and low rates of communicating with friends by text, social media, or phone (22%, 18%, and 20%, respectively) as compared to individuals in other disability categories. Data from this longitudinal study indicated high levels of social isolation for adolescents with ASD, more so than for students with

Intellectual Disability or multiple disabilities (Lipscomb et al., 2017). Additionally, Locke, Ishijima, Kasari, and London (2010) found that adolescents with ASD experienced significantly more loneliness than their typically developing peers and also recognized the poor quality of their friendships. Even if there is a desire to establish friendships, individuals with ASD typically may not have a complete or realistic idea of what friendship entails (e.g., one-sided friendships or friendships based only on shared special interests; APA, 2013). Taken together, these research findings indicate individuals with ASD are often not successful engaging socially, which leads to feelings of loneliness and social isolation (Ahlers et al., 2017; Lipscomb et al., 2017).

Understanding Emotions Deficits in ASD

One large social-emotional deficit that individuals with ASD have often shown, and that researchers theorize is at the root of all social and emotional impairments related to ASD, is the inability to understand emotion; more specifically, an inability to correctly identify and interpret the emotions and feelings of others (Conallen & Reed, 2016; Baron-Cohen et al., 2009; Fishman et al., 2014; Hobson et al., 1989; McKenzie et al., 2018; Schmick et al., 2018; Tanaka et al., 2012; Uljarevic & Hamilton, 2013). The ability to recognize the emotions of others contributes to the development of a large range of social and emotional competencies, such as the ability to form friendships and understand social interactions. This ability to recognize and understand emotions has also been shown to contribute to improving mental health and well-being, increasing future academic success, and reducing externalizing and disruptive behaviors (Conallen & Reed, 2016). On the other hand, the inability to recognize the emotions of others, such as what is seen in individuals with ASD, has been linked to inappropriate behaviors, as well as mental health, personal, social, and academic difficulties (LeBlanc et al., 2003; McHugh et al., 2011; Ratcliffe et al., 2014; Schmick et al., 2018).

It is apparent that individuals with ASD do not have the same ability to recognize the emotions of others as their typically developing peers do. Individuals with ASD tend to show a lack of mutual sharing of emotions, impaired or inappropriate response to others' emotions, and a lack of spontaneous seeking to share enjoyment (Ahlers et al., 2017; Uljarevic & Hamilton, 2013). Additionally, individuals with ASD frequently have a difficult time interpreting the way others are perceiving a social situation (Ahlers et al., 2017). This deficit leads to a lack of empathy and a lack of emotional engagement with others because of the difficulty individuals with ASD have in relating to others and recognizing others' emotions (Fishman et al., 2014; Hadjikhani et al., 2006; Rump, Giovannelli, Minshew, & Strauss, 2009). In turn, this creates further and more complicated difficulties with social interactions for individuals with ASD, which research has indicated reduces the number of verbal exchanges that individuals with ASD will successfully engage in or initiate (Conallen & Reed, 2012; McHugh et al., 2011; Tanaka et al., 2012).

Aside from understanding the emotions and feelings of others, individuals with ASD also show impairments in the ability to interpret their own emotional states (Ben-Itzchak, Kirzon, Peled, & Zachor, 2018; Conallen & Reed, 2016; McHugh et al., 2011; Schmick et al., 2018). Research is still unclear on whether the ability to recognize the emotional states of others is dependent on the ability to recognize one's own emotional state, or whether the ability to recognize one's own emotions is an entirely independent system that is unrelated (Williams & Happé, 2010). Research does show understanding one's own emotions is a crucial part of the social-emotional development of early childhood and is considered a precursor for later social-emotional reciprocity abilities. Reporting on one's own internal emotional state requires not only the recognition of different cues that represent the different emotions, but it also requires the

ability to use the language related to these emotions (Ben-Itzchak et al., 2018). However, learning emotion-language presents a unique challenge to individuals with ASD. Although some research does show that some individuals with ASD can have the ability to talk about their own emotions, these individuals are often limited by their lack of mastery of the semantics and pragmatics related to the terms for the different emotional states (Conallen & Reed, 2016).

Research has indicated that an impairment in facial emotional expression recognition is one major contribution to ASD individuals' general lack of understanding of emotion (Ashwin et al., 2006; Conallen & Reed, 2016; Ha et al., 2015; Lacroix et al., 2009; Piggot et al., 2004; Rump et al., 2009; Schmick et al., 2018; Tanaka et al., 2012; Uljarevic & Hamilton, 2013). In typically developing children, recognition of emotional facial expressions is an early developing social skill, beginning to develop as early as three or four months old (Rump et al., 2009; Uljarevic & Hamilton, 2013). By the fourth year of life, typically developing children are able to competently attribute emotion from basic facial expressions, such as happiness, sadness, and anger, while they are also becoming more adept at recognizing fear and surprise (Piggot et al., 2004; Rump et al., 2009). This skill, as well as the speed with which individuals are able to process emotions, appears to continue to develop through adolescence before reaching its peak during adulthood (Rump et al., 2009; Thomas, De Bellis, Graham, & LaBar, 2007). Then, by adulthood, typically developing individuals are both highly proficient and very fast at perceiving expressions of emotions in other people (Ekman, 2003).

However, researchers have shown that expression recognition abilities develop more slowly and reach their peaks sooner in the ASD population as opposed to typically developing individuals (Tanaka et al., 2012). Individuals with ASD have been found to have particular difficulties with attributing emotions from more subtle facial expressions, as well as from

multiple facial expressions, in social situations (Piggot et al., 2004). Research suggests that individuals with ASD have these deficits in attributing emotion from facial expressions because faces are less salient to them, making these individuals less attentive to faces (Ashwin et al., 2006; García-Blanco et al., 2017; Piggot et al., 2004; Smith et al., 2010). In a study conducted by García-Blanco et al. (2017), children with ASD showed a significant attentional bias away from angry faces as compared to typically developing peers. Additionally, Lacroix et al. (2009) stated that individuals with ASD will usually prefer inanimate objects over human faces. This disinterest and inattentiveness to others' faces consequently leads to individuals with ASD accumulating less experience with facial emotional expression recognition, further contributing to their general lack of understanding of emotion (Piggot et al., 2004).

The ability to recognize and interpret facial expressions is critical to normal social functioning (Tanaka et al., 2012). Facial expressions of emotions have been proposed to be the foundations of social interaction, as they convey essential non-verbal cues for inferences about the motivations and intentions of others (Darwin, 1872). Ekman and Friesen (1971) stated that facial expressions are the outward manifestation of either people's internal emotional states or the internal emotional states people wish to convey to the external observer. Facial expressions are also a basic source of information about important objects and events in the environment (Uljarevic & Hamilton, 2013). Recognition of facial emotional expressions is one of the primary signals used in understanding the feelings and intentions of others, so the ability to recognize facial emotional expressions is essential in establishing and maintaining interpersonal connections within social interactions (Lacroix et al., 2009; Rump et al., 2009; Tanaka et al., 2012). Failure to develop emotion recognition skills cuts individuals with ASD off from being able to learn about other people's feelings and responses (Uljarevic & Hamilton, 2013). When

individuals with ASD have these deficits in perceiving facial emotional expressions, they are at a disadvantage when attempting to interpret the emotional states and intentions of others, invariably leading to greater difficulties in social interactions (Humphreys et al., 2007; Tanaka et al., 2012).

Facial emotional expression recognition has been the focus of much of the research in ASD (Ben-Itzchak et al., 2016; Humphreys et al., 2007; Richard et al., 2015; Rump et al., 2009; Smith et al., 2010; Uljarevic & Hamilton, 2013). Most of this research has specifically focused on exploring the deficits individuals with ASD have in recognizing the six basic emotions (i.e., happiness, sadness, surprise, anger, disgust, and fear). Ashwin et al. (2006) found that, overall, individuals with ASD were less accurate than their typically developing peers at recognizing basic emotions as portrayed in photographs of facial expressions. Specifically, the individuals with ASD revealed impairments in recognizing the negative emotions of fear, disgust, anger, and sadness. However, no group differences between the participants with ASD and the typically developing control participants were found for recognition of the non-negative expressions of happy, surprise, and neutral. These results indicate that individuals with ASD show more apparent deficits for recognizing basic emotions with negative valence. In the following year, Humphreys et al. (2007) found similar results. Participants with ASD showed a marked difference in the recognition of fear and disgust, as compared to their typically developing peers. The most striking emotional recognition deficit that Humphreys et al. (2007) found was in the recognition of fear. Of the participants with ASD, 10 out of 20 fell more than two standard deviations below the comparison group mean in their recognition of fear. These results again indicate that individuals with ASD have significant deficits in the recognition of negative basic emotions.

Other research has shown that individuals with ASD are better at recognizing simple emotions related to external situations, such as happiness and sadness, than they are at recognizing those more complex emotions, such as flirtatiousness and embarrassment (Ashwin et al., 2006; Humphreys et al., 2007; Lacroix et al., 2009). Rump and colleagues (2009) also found that individuals with ASD were not as proficient as their typically developing peers at recognizing basic emotions, such as angry and afraid, when the emotions were shown in a more subtle or fleeting manner. Smith et al. (2010) found similar results in that participants with ASD were less accurate at recognizing the emotional expressions of anger, disgust, and surprise at low levels of intensity (i.e., subtle displays of emotion) as compared to control participants. More specifically, participants with ASD were impaired in surprise recognition only at the low intensity level and not at any higher intensities; anger recognition was slightly impaired in the low and medium intensity levels and not at the high intensity level; disgust recognition was impaired at all three levels of intensity. Even though some individuals with ASD have been shown to become more proficient at recognizing basic emotional expressions as they become older, adults with ASD still appear to struggle with more fleeting and subtle expressions of emotion. Although not directly tested, several research studies have suggested that even though individuals with ASD seem to become more proficient at recognizing basic emotional expressions as they grow older, adults with ASD still struggle with more fleeting or subtle emotions (e.g., Humphreys et al., 2007; Mazefsky & Oswald, 2007; Pelphrey et al., 2002). Rump et al. (2009) even went as far as to suggest that individuals with ASD will never reach the level of skill demonstrated by their typically developing peers in recognizing emotions (Rump et al., 2009).

Uljarevic & Hamilton (2013) recently conducted a meta-analysis which sought to sum up previous research findings and evaluate the true deficits individuals with ASD possess in recognizing emotions. There were 48 studies examined through the meta-analysis, involving over 930 participants with ASD. A large negative effect size (-0.80) was found using MetaWin 2.0 (Rosenberg, Adams, & Gurevitch, 2007), suggesting that there is indeed a general impairment in emotion recognition in individuals with ASD. Sixteen of the studies, including 379 participants with ASD, reported data on the recognition of the six different basic emotions. These data were analyzed to determine differences in deficits across the individual emotions. Results indicated that individuals with ASD had difficulties in the recognition of the five basic emotions of sadness, anger, surprise, fear, and disgust. However, results indicated that individuals with ASD did not have difficulties in the recognition of happiness. Uljarevic & Hamilton's (2013) meta-analysis map on to the general findings of the previously discussed literature on emotion recognition deficits in individuals with ASD.

Theoretical Foundations

Several theories have been proposed to explain the emotion recognition deficits of individuals with ASD. First, researchers have theorized that a dysfunction in the brain's Mirror Neuron System (MNS) could be the basis for several of the social-emotional difficulties individuals with ASD face, including deficits in empathic abilities which affect individuals' ability to see things from others' perspectives (Fishman et al., 2014; Ha et al., 2015; Hadjikhani et al., 2006; Wadsworth et al., 2018). Since its discovery, the MNS has been shown to be made up of a network of areas that are activated during the observation and imitations of an action, including the inferior frontal gyrus, ventral premotor cortex, and the inferior parietal lobe (Fishman et al., 2014; Hadjikhani et al., 2006; Wadsworth et al., 2018). The MNS refers to the

brain's mirror mechanisms that allow humans to understand the meaning of actions, emotions, and experiences of others by internally simulating and replicating them (Fishman et al., 2014; Hadjikhani et al., 2006). This understanding is essential for having appropriate social-communicative functioning (Fishman et al., 2014).

Another area of the brain that is theorized to contribute to emotion recognition deficits in ASD that is among the most agreed upon single neurobiological markers of ASD is the amygdala (Ashwin et al., 2006; Herrington et al., 2016; Piggot et al., 2004; Richard et al., 2015). The amygdala is the structure in the brain that is primarily responsible for the processing and memory of emotional reactions, including the assessment of the emotional salience of facial expressions. Hypotheses attribute amygdala disfunction to ASD propose that a reduced activation of this region is responsible for the social understanding deficits in individuals with ASD (Piggot et al., 2004; Richard et al., 2015). Diminished amygdala function has been found to lead to a lack of orienting to social stimuli. In particular, diminished activation of the amygdala has been linked to a lack of orienting to the eyes and eye region on a face (Baron-Cohen et al., 2000; Chevallier, Kohls, Troiani, Brodkin, & Schultz, 2012; Herrington et al., 2016; Schultz, 2005). Processing of the eye region is especially relevant to the recognition of the fear and anger emotions, because specific attention to the eyes and eyebrows is needed in order to identify this emotion. Therefore, Adolphs et al. (2005) theorized that amygdala dysfunction could lead to deficits in the recognition of fear and anger in individuals with ASD.

Cognitive theorists have suggested that the emotion recognition difficulties seen in ASD results from a partial or total lack of ability to perform a particular sort of cognitive operation (Bushwick, 2001). It has been suggested that typically developing individuals possess an innate cognitive mechanism that allows them to understand that others have inner mental activities,

such as thoughts, desires, feelings, emotions, and beliefs (Baron-Cohen, 1995; Fishman et al., 2014). This mechanism or ability is what the general term ToM refers to (Baron-Cohen, 1995). In short, ToM involves the ability to attribute mental states and emotions in others (Ben-Itzchak et al., 2016; Smith et al., 2010). ToM theorists claim that anyone who lacks this innate cognitive mechanism is essentially unable to understand the concept of others' intentions, because this requires having the ability to understand others' inner mental activities. This inability in turn leads to reduced interest in social interactions, which can then cause major social impairment (Bottini, 2018). Therefore, the ToM network is considered necessary for maneuvering appropriately within social situations (Fishman et al., 2014; Ha et al., 2015).

Numerous theorists have suggested that a core deficit in individuals with ASD is a difficulty in ToM. Baron-Cohen, Spitz, and Cross (1993) first suggested that social-emotional deficits in individuals with ASD could be caused by difficulties in ToM. Specifically, Baron-Cohen et al. (1993) indicated that ToM difficulties were what led to selective impairments in the recognition of surprise in individuals with ASD. Of the six basic emotions, surprise is the only one that requires the assessment of another person's mental state (e.g., "he expected something different, so he is surprised; Uljarevic & Hamilton, 2013). Therefore, Baron-Cohen et al. (1993) theorized that impairments in ToM in individuals with ASD lead to impairments in mental state judgements, which thus leads to impairments in the specific recognition of the surprise emotion. Heerey, Keltner, and Capps (2003) added to this theory in that higher functioning individuals with ASD were more deficient in the recognition of the more complex emotion of embarrassment, which also requires the assessment of another person's mental state, as compared to their typically developing peers. This finding did not appear to be related to

perceptual deficits or more general emotion recognition deficits, but rather to ToM ability (Heerey et al., 2003).

Aside from biological and cognitive explanations for the social and emotional deficits seen in individuals with ASD, behavioral theories have also been suggested. Behavioral theorists have attributed ASD and the social-emotional impairments of ASD to the social learning theory (Bandura, 1971). Social learning theory proposes individuals acquire knowledge, skills, and behavior patterns from others, either by training, whether intentional or unintentional, or by other means of imitation. Learning occurs when the child witnesses or realizes that the model's behavior is reinforced (Patterson & Smith, 2010). According to the social learning theory, it is imperative the individual attends appropriately to the model in order to extract and retain the important components of each interaction (Bandura, 1971). In young children with ASD, a lack of social and communication abilities can hamper learning through social interaction, understandably causing a disruption in the social learning cycle (APA, 2013). From a social learning theory perspective, Patterson and Smith (2010) suggested that impairments in joint attention and imitation further compound the difficulties that children with ASD possess in coordinating play skills with typically developing peers. Additionally, Bushwick (2001) indicated that a disruption to the social learning cycle can cause language deficits in individuals with ASD, as well as deficits in the understanding of others' emotions.

Prompt Delay Procedures

The understanding of emotions in ASD has primarily been examined through the ability to recognize different types of emotions in facial expressions using emotion labeling or matching emotions to visual stimuli (Ben-Itzchak et al., 2016; Uljarevic & Hamilton, 2013). Baron-Cohen, Leslie, and Frith (1985) identified recognizing and labeling situation-specific emotions and/or

feelings as a key problem area for children with ASD. Several applied behavior analytic strategies have been suggested in previous literature as effective ways to teach the recognition and labeling of situation-based emotions. One such strategy involves the use of prompt delay procedures. Prompt delay procedures initially involve a clinician presenting an instruction to a client and immediately prompting the correct response. After a few trials of immediately prompting the correct response, the clinician then creates a short delay between the instruction and the prompt (Brandt, Weinkauf, Zeug, & Klatt, 2016). Response prompts such as these function as a way for clinicians to model the correct response, and the delay functions to provide the client with an opportunity to respond independently, therefore transferring control of the response from the prompt to the instruction (Aykut, 2012; Brandt et al., 2016; Hughes & Fredrick, 2006).

One heavily studied prompt delay procedure is the constant time delay procedure, which is a response-prompting approach that promotes near errorless learning, as well as provides frequent opportunities to respond and immediate feedback and consequences for responses (Aldemir & Gursel, 2014; Hughes & Fredrick, 2006; Rogers, Hemmeter, & Wolery, 2010). In the constant time delay procedure, the short delay that clinicians create between the instruction and the prompt remains a constant duration of time, rather than incrementally increasing the duration as done in the progressive time delay procedure (Brandt et al., 2016). For example, during the initial trials using a constant time delay procedure for a predetermined number of trials, the client is provided with the correct answer immediately following the instruction (i.e., 0-second prompt delay trials). During subsequent trials, the client is given a constant duration of time, such as 3 or 5 seconds, as an opportunity to respond independently before the answer is provided (Aykut, 2012; Hughes & Fredrick, 2006). Constant time delay procedures have been

used across a number of settings with clients of different ages and disabilities (Aldemir & Gursel, 2014; Rogers et al., 2010). These procedures have also been used to teach a number of skills, such as academic, self-help, leisure, and daily living skills (Aykut, 2012; Brandt et al., 2016; Hughes & Fredrick, 2006; Rogers et al., 2010). McHugh and colleagues (2011) used these systematically faded out response prompts to teach children with ASD to label situation-based emotions using video-based scenarios.

Video-Based Interventions

Another strategy effective at teaching individuals with ASD recognition and labeling of situation-based emotions is video-based intervention. Video-based interventions include any interventions involving the exposure of video footage as an independent variable for a teaching or treatment procedure, which can be an effective component in improving clients' learning and skill acquisition (Rayner, 2015; Yakubova, Hughes, & Hornberger, 2015). Technologies used to implement video-based interventions have grown tremendously over the last three decades, evolving from VHS videotapes and television screens to digital cameras and laptops to now the more current use of tablet computer devices. These advances in technology mixed with the development of high-quality user-friendly video and editing equipment available at relatively low costs has made video-based intervention much more accessible to practitioners and parents (LeBlanc, 2010; Rayner, 2015). Additionally, interventions that utilize video technology have strong research support spanning several decades (Yakubova et al., 2015). A wide range of behaviors have been targeted by video-based interventions, including communication, social, behavior, play, academic, motor, vocational, and self- help skills (Rayner, 2015; Stauch, Plavnick, Sankar, & Gallagher, 2018; Yakubova et al., 2015).

Video-based interventions have been especially well documented and supported among individuals with ASD (Mineo, Ziegler, Gill, & Salkin, 2009; Rayner, 2015; Yakubova et al., 2015). Mineo and colleagues (2009) indicated that not only do many children with ASD have a propensity for learning from video and computer games, but they also have a preference for visual stimuli, especially when delivered via electronic screen. Research has shown that the incorporation of video technology into intervention can be an equalizer for individuals with disabilities, such as ASD, that enables the individuals to engage in learning at an individual pace that provides ample opportunities for repeated practice (Yakubova et al., 2015). Additionally, video-based interventions have been considered an effective treatment approach for individuals with ASD because they minimize attentional and language demands and require the individual to look at only a small spatial area (Keen, Brannigan, & Cuskelly, 2007; Mineo et al., 2009). An extensive review of the literature on video-based intervention for children with ASD conducted by Ayres and Langone (2005) found that video-based interventions have shown to be effective in increasing a variety of social skills, such as conversation skills and eye contact, and functional skills, such as making purchases while shopping and hand washing.

The most common video-based intervention is video modeling, which involves the individual watching a video of someone correctly performing a skill or target behavior, followed by an opportunity to imitate the skill or behavior (LeBlanc, 2010). Video modeling can be presented in three variations, including (1) video modeling with another person as the model, (2) video self-modeling, and (3) point-of-view modeling (Mason, Ganz, Parker, Burke, & Camargo, 2012). Other video-based interventions include video prompting, computer-based video instruction, video feedback, and video-based discrimination training (LeBlanc, 2010; Yakubova et al., 2015). In video-based discrimination training, the individual watches a video and

determines which behavior or category of behavior is exemplified in each scene (e.g., rude or polite, friendly joking or bullying; LeBlanc, 2010). This type of video-based intervention is what has most frequently been used in teaching individuals with ASD the ability to recognize different types of emotions in facial expressions using emotion labeling or matching emotions to visual stimuli. For example, McHugh and colleagues (2011) used videos of puppets enacting different scenarios in their intervention to teach children with ASD to discriminate between the emotions of happy, sad, angry, and afraid. More recently, Schmick and colleagues (2018) used real-life videos of people in various situations to teach children with ASD to discriminate between the emotions of happy, angry, scared, and excited.

Three recent research studies have explored specific techniques to teach children with ASD the ability to label situation-based emotions, including those mentioned above. First, McHugh, Bobarnac, and Reed (2011) aimed to empirically assess a method of teaching children with ASD to label the situation-based emotions of happy, sad, angry, and afraid. McHugh and colleagues (2011) used a multiple probe design across emotions for each participant. Participants were three five-year-old males, all with ASD diagnoses. The teaching method used by McHugh and colleagues (2011) involved videos that portrayed two puppets, familiar to the children, acting out different situations that pertained to each of the four target emotions. This teaching method also included what the authors referred to as "systematically faded out prompts", which began with a 0-second prompt delay procedure. McHugh and colleagues (2011) used a reinforcement procedure for correct answers, which included verbal praise and reinforcing items, as well as an error correction procedure, which involved the researcher saying "no" and implementing a prompted learning trial to ensure a correct response from the participant. Results suggested, using these procedures, children with ASD were able learn to label situation-based

emotions portrayed in video scenarios of puppets. Results also indicated that happy may have been the easiest trained emotion for the participants in this study, as evidenced by happy being the only emotion that did not drop below 100% accuracy during the generalization phase across all three participants.

A second and more recent research study exploring techniques to teach children with ASD to label situation-based emotions was conducted by Conallen and Reed (2016). In their study, Conallen and Reed (2016) aimed to explore a teaching procedure designed to enable children with ASD to label the situation-based emotions of happy, sad, and angry. Conallen and Reed (2016) used a multiple baseline design across participants. Participants were ten children between the ages of six and nine, all with ASD diagnoses. The teaching procedure involved black and white cartoon illustrations depicting different situations that pertained to each of the three target emotions. This procedure used a 0-second prompt delay teaching phase after baseline, similar to McHugh and colleagues' (2011) method. This method also used a reinforcement procedure for correct answers, which included specific verbal praise statements, such as "Good job, the boy is happy because it's his birthday!". Overall, results of the study suggested participants' ability to label situation-based emotions, as depicted in the illustrations, improved as a result of the researchers' training. Further, results indicated that happy was the least accurately identified emotion during baseline, but it was the most accurately identified emotion during the maintenance phase.

Schmick, Stanley, and Dixon (2018) conducted the third and most recent research study exploring the effectiveness of an intervention to teach individuals with ASD to label situation-based emotions. This study evaluated a teaching strategy targeting the identification of the situation-based emotions of happy, angry, scared, and excited. Schmick and colleagues (2018)

used a multiple baseline design across participants. Participants included three adolescent males between the ages of thirteen and seventeen years old, all with ASD diagnoses. The teaching method used by Schmick et al. (2018) involved videos of natural, real-life situations depicting the four target emotions. This teaching method included stimulus equivalence and multiple-exemplar training in order to train participants to be able to label the situation-based emotions of others. Schmick and colleagues (2018) also used a reinforcement procedure for correct answers, which involved social praise, and an error correction procedure for incorrect answers, which involved stating the correct answer and having the participant repeat the correct response. Overall, results indicated adolescents with ASD were able to be taught to identify the situation-based emotions of others portrayed in real-life videos. Schmick et al. (2018) did not look at individual differences across the four tested emotions.

Study Purpose

The purpose of the current study is to extend the previous literature on effective strategies for teaching the ability to label situation-based emotions. The current study seeks to do this by exploring a technique combining multiple elements used in previous research studies in order to teach individuals with ASD the ability to label situation-based emotions. The combined elements include animated videos depicting the emotions of happy, sad, angry, and afraid, as well as prompt delay procedures, error correction procedures, and reinforcement procedures. The prompt delay, error correction, and reinforcement procedures used in the current study are similar to those used in McHugh et al.'s (2011), Conallen and Reed's (2016), and Schmick et al.'s (2018) studies. The animated videos used in the current study combine elements of the puppet videos used in McHugh et al.'s (2011) study with the cartoon illustrations used in Conallen and Reed's (2016) study, as well as the real-life videos used in Schmick et al.'s (2018) study. The current

study also seeks to examine if the combined technique will be more effective in teaching certain emotions, similar to McHugh et al. (2011) and Conallen and Reed (2016).

Research Questions

This study seeks to answer the following research questions:

Research Question #1: Does the use of animated videos with constant time delay prompt procedures increase children with ASD's ability to label situation-specific emotions? (Conallen & Reed, 2016; McHugh et al., 2011; Schmick et al., 2018)

Research Question #2: Will using animated videos and systematic prompt delay procedures be more effective in teaching certain emotions? (Ashwin et al., 2006; Humphreys et al., 2007; Lacroix et al., 2009)

CHAPTER III

METHODOLOGY

The current study examined the effects of animated video and prompt delay procedures in three male participants with ASD. Animated videos were created using an online program to display happy, sad, mad, and afraid situations. A multiple baseline design was used, and visual analysis was the primary data analysis procedure.

Setting, Recruitment, and Participants

The participants in the current study were recruited from a university-based school psychology services clinic located in the southeastern United States. The study was conducted by the primary researcher, as well as two trained graduate clinicians. Intervention sessions took place in a large treatment room that contained a table and chairs and minimalized outside distractions. Three children were recruited to participate individually in the intervention procedures. Participants of Conallen and Reed's (2016) study ranged from six to nine years of age, and participants of McHugh, Bobarnac, and Reed's (2011) study were all five years of age; therefore, the researchers of the current study recruited participants between the ages of five and nine years old. A recruitment flyer [Appendix A] was given to families of clients at the university-based clinic, as well as posted on the clinic's social media accounts. Once a list of potential participants was generated, the primary researcher conducted screening via a demographic questionnaire to evaluate the inclusionary criteria for each potential participant. Then, when final participants were identified through this pool of children, consent to participate

and consent to use clinical data was gathered from each of the participants' families prior to beginning the study. Additionally, prior to data collection, the Office of Research Compliance was contacted, and the researchers received approval from The Institutional Review Board for the Protection of Human Subjects in Research (IRB) [Appendix I].

Demographic Questionnaire

To determine if potential participants met all of the inclusionary criteria for the study, as well as to obtain additional information for each participant, families of potential participants were instructed to complete a demographic questionnaire prior to beginning the study. Inclusionary criteria to participate in the study included: (a) the child is between the ages of 5 years 0 months and 9 years 11 months, (b) the child has a diagnosis of ASD, (c) the child does not have any major behavioral concerns that will hinder the child's ability to participate in sessions, (d) the child is able to attend towards and view a ten second video, (e) the child has adequate vocal abilities to be able to say the names of the tested emotions, and (f) the child has parent-reported deficits in understanding emotions. Exclusionary criteria included: (a) the child engages in echolalia and (b) the child exhibits hearing or vision deficits that will affect viewing of animated videos. Therefore, questions on the demographic questionnaire were designed to obtain adequate information on each of these criteria, as well as to obtain additional demographic information and information about potential reinforcers for each participant. The demographic questionnaires completed by potential participants' families were screened by the primary researcher, and participants were then chosen from this pool of children. A copy of the demographic questionnaire can be found in Appendix B.

Participants

Participants included three male children enrolled in services at the university-based clinic. Participant 1 was seven years three months old, Participant 2 was eight years four months old, and Participant 3 was five years three months old. All three participants had been diagnosed with ASD in either an educational or medical setting. Participant 1 also had a comorbid diagnosis of ADHD. Additionally, all three participants were reported to speak over 50 words independently.

Materials

Throughout the current study, a total of 20 animated videos were shown to each of the participants. The animated videos were developed by the primary researcher through the online video platform VYOND™ (i.e., https://www.vyond.com), formerly known as GoAnimate, Inc.©. VYOND™ allows users to develop narrative-style videos, a type of video in which characters speak with lip-sync. This video platform also gives users access to hundreds of characters, actions, settings, props, and other resources to create specific situation-based videos. Using the online video platform of VYOND™, animated videos were created to depict all of the same four situation-based emotions as used in McHugh et al.'s (2011) study (i.e., happy, sad, mad, and afraid). Each of the four situation-based emotions were represented by five animated videos depicting five different scenarios pertaining to each emotion, equaling a total of twenty animated videos in all. As in Conallen and Reed's (2016) study, scenarios were modified from the Black Sheep Press® Pragmatics 1: Emotions/Facial Expressions, Second Edition.

The animated videos ranged between 8 and 13 seconds, with an average length of ten seconds, similar to the video lengths used in McHugh et al.'s (2011) study. The primary researcher created animated videos that used characters of a variety of genders, races, and

physical appearances. Dialogue used in the animated videos portrayed robotic-like voices to avoid the use of emotional prosody. Emotional prosody, defined as the tone and intonation of voice, conveys vital information about the speaker's communicative intentions and is processed implicitly without the presence of explicit verbal cues (Peppé, McCann, Gibbon, O'Hare, & Rutherford, 2007; Ploog, Banerjee, & Brooks, 2009; Rosenblau, Kliemann, Dziobek, & Heekeren, 2017). However, much research has shown that individuals with ASD have significant impairments in the processing of emotional prosody (Rosenblau et al., 2017). Therefore, to control for these deficits, the researchers avoided using emotional prosody in the dialogue of the animated videos. Scripts for each of the twenty animated videos can be found in Appendix C.

Aside from the 20 animated videos, materials used in the current study included an iPad® and numerous tangible items. The iPad® was used as the delivery method for the animated videos, and the tangible items were used as noncontingent reinforcement in between intervention trials. Tangible items included snacks, such as Goldfish and chips, and small toys, such as cars and blocks. Tangible items used as noncontingent reinforcement for each participant were identified through the demographic questionnaires filled out by participants' families.

Independent Variables

The independent variables in the current study were the varied use of an antecedent response prompt across phases. In McHugh et al.'s (2011) study, researchers conducted emotion recognition training with participants through the use of an echoic prompt, such as "Say happy", after showing the participants videos portraying emotions and asking them how the video characters felt. McHugh and colleagues (2011) stated that this prompt was systematically faded over the course of their training. Constant time delay procedures using antecedent response prompts typically start with a 0-second delay, which includes the simultaneous presentation of

the natural stimulus and the response prompt. Trials that follow the 0-second delay condition then typically apply a fixed time delay, such as 3 seconds, between the presentation of the natural stimulus and the presentation of the response prompt (Cooper, Heron, and Heward, 2007). Therefore, the researchers systematically faded the response prompts across phases through the use of these constant time delay procedures.

Dependent Variable

The dependent variable in the current study was the percentage of correctly identified emotions per trial when asked how a main character of an animated video felt after watching the situational video. Answers were scored as correct if the participant said a word describing the emotion (i.e., happy, sad, mad, or afraid) that correctly matched the situation depicted in the animated video. A list of acceptable answers for each of the four emotions can be found in Appendix D. Answers were scored as incorrect if the participant said the name of an incorrect emotion or a word not on the acceptable answer list. Answers were also scored as incorrect if the participant did not make a response within ten seconds. If the participant stated an incorrect answer but self-corrected before being given any prompts, the answer was scored as correct. Across all phases, one trial included twenty sub-trials. Therefore, the percentage of correct answers per trial was calculated by dividing the number of correct answers by 20, and then multiplying by 100 (e.g., 18 correct answers divided by 20 sub-trials multiplied by 100 equals 90% correct answers for that trial).

Training, Interobserver Agreement, and Treatment Integrity

The primary researcher collected data during each session; however, a secondary graduate clinician was also present in each session. Two secondary graduate clinicians were

trained on the implementation and data collection procedures of the current study. For training purposes, the primary researcher first reviewed objectives of the study and protocols for each phase with the secondary graduate clinicians. Then the primary researcher modeled four example sub-trials per phase for the secondary graduate clinicians, and the clinicians were required to collect interobserver agreement (IOA) and treatment integrity (TI) data for the example trials. Minimum acceptable values of IOA range from 80% to 90% (Kratochwill et al., 2010); therefore, clinicians were trained to at least 90% accuracy on both IOA and TI data collection prior to beginning the current study. If a secondary clinician ever dropped below 90% on IOA or TI data throughout the course of the study, the primary clinician planned to immediately retrain; however, this never occurred.

Kratochwill et al. (2010) states that IOA should be collected on at least 20% of data points in each phase, and should be collected in every phase, to meet evidence standards. In the current study, IOA and TI data were collected in 100% of trials for each phase, surpassing the suggested criteria. IOA and TI data were collected by having the trained secondary graduate clinician attend sessions in person and independently collect data on each of the participant's answers and which steps were completed and not completed by the primary researcher. One secondary graduate clinician was present for 100% of trials with Participant 1 and Participant 2, and the other secondary graduate clinician was present for 100% of trials with Participant 3. IOA was calculated for each trial by dividing the number of agreements on correct and incorrect answers by twenty and then multiplying by 100%. TI was calculated by dividing the number of steps completed correctly by the total number of possible steps. IOA and TI was 100% across all trials.

General Procedures

Data were collected individually with participants during two to three sessions each, each session lasting between one and four hours, depending on the participants' availability. During each session, noncontingent reinforcement was provided to each participant in between trials. This functioned to serve as a short break for participants in between trials, as during each trial participants were made to watch all 20 animated videos.

Prior to beginning each trial, the primary researcher ensured that each data collector had a physical copy of the acceptable answers [Appendix D], the data collection form [Appendix E], the treatment integrity form [Appendix F], and the protocol for the specific phase that was being implemented. Protocols for each phase can be found in Appendix G. Additionally, prior to each trial, the primary researcher randomized the twenty animated video codes [Appendix H] using an online list randomizer (i.e., random.org), such that each animated video was used exactly once per trial across the twenty sub-trials. This pre-determined, randomized order was filled into each data collection form prior to beginning each trial. Each animated video was also pulled up on the iPad® prior to beginning each trial as to ensure quick delivery during the trial. Lastly, each trial was recorded in case the primary researcher needed to recollect data or missed an answer.

According to Kratochwill et al. (2010), multiple baseline design studies need a minimum of five data points per phase to meet evidence standards. Therefore, each participant completed no less than five trials per phase. For the 0-second prompt delay and 3-second prompt delay phases, mastery criteria was set at 80% correct or above in at least three total trials. Start point randomization, using a range of three possible start points, was also applied in order to determine when exactly each participant would move into the next phase (Levin, Ferron, & Gafurov, 2014). In the event that the participant had not met mastery criteria prior to the trial that randomization

determined should be the start point of the next phase, the primary researcher continued through the previous phase until the participant met mastery criteria (i.e., mastery criteria supersedes start point randomization). If a participant did not meet mastery criteria after ten trials, the researcher planned to discontinue the phase and move on to the next phase; however, this was never the case.

Baseline

Within each trial of baseline, participants completed twenty sub-trials. Each sub-trial consisted of the researcher showing the participant one randomized animated video on the iPad®. During each sub-trial, as soon as a video ended, the researcher pointed to the main character on the screen and asked, "How does he/she feel?". If the main character had exited the scene before the end of the video, the researcher pointed to the place where the character exited instead and asked the same question. If the participant said an acceptable answer for the emotion (i.e., happy, sad, mad, or afraid) that correctly matched the situation depicted in the animated video, the answer was scored as correct. If the participant said the incorrect emotion or did not make a response within 10 seconds, the answer was scored as incorrect. Following these procedures, the next animated video was pulled up on the iPad® and the next sub-trial started, until all 20 sub-trials were completed. No feedback or error correction procedures were given to the participants following their answers during baseline trials.

0-Second Prompt Delay Phase

Following baseline, the 0-second prompt delay phase was used as a teaching phase. Within each trial of the 0-second prompt delay phase, participants again completed twenty sub-trials using all twenty animated videos. The 0-second prompt delay phase consisted of the same

procedure as described above in baseline: that is, each sub-trial consisted of the researcher showing participants one randomized animated video on the iPad and asking how the main character felt at the end. However, two additional procedures were introduced during this teaching phase – a prompting procedure and a feedback procedure. For the prompting procedure, during each sub-trial of this phase, an echoic prompt (e.g., "Say happy") immediately followed the question of how the main character felt, such that no time passed in between the question and the prompt. For the feedback procedure, during each sub-trial of this phase, specific verbal praise was presented for each correct answer. The specific verbal praise involved the following script for each correct answer, depending on what situation was presented: "Yes, good job! The boy is happy because his favorite player hit a homerun!". Also, an error correction procedure was presented for each incorrect answer or non-answer. The error correction procedure involved the following script for each incorrect or non-answer, depending on what situation was presented: "No, that's not quite right! The boy is happy because his favorite player just hit a homerun. Say happy!". If the participant said an acceptable answer for the emotion that correctly matched the situation depicted in the animated video, the answer was scored as a prompted correct answer on the Data Collection Form, and the positive feedback procedure was used. If the participant said the incorrect emotion or did not make a response within ten seconds, the answer was scored as a prompted incorrect answer on the Data Collection Form, and the error correction procedure was used. Following these procedures, the next animated video was pulled up on the iPad® and the next sub-trial began, until all 20 sub-trials were completed. Participants were required to reach the mastery criteria of 80% correct or above in at least three trials before eligible to move into the next phase. The phase was to be discontinued if the participant had not met mastery criteria

after 10 trials, and the participant was to be automatically moved into the next phase; however, this was never the case.

3-Second Prompt Delay Phase

Following the 0-second prompt delay phase, the 3-second prompt delay phase was implemented. Within each trial of the 3-second prompt delay phase, participants again completed twenty sub-trials using all twenty animated videos. The 3-second prompt delay phase consisted of the same procedure as described above in the 0-second prompt delay phase: that is, each sub-trial consisted of the researcher showing participants one randomized animated video on the iPad and asking how the main character felt at the end, and a prompting procedure and feedback procedure following the above scripts was used during each sub-trial. The feedback procedure was kept consistent with the feedback procedure used during the previous phase. However, the prompting procedure was slightly changed. Instead of immediately delivering the echoic prompt following the question, the researcher used a 3-second delay. Immediately following the presentation of the question of how the main character felt, the researcher waited three seconds for the participant to give an answer independently. If the participant did not respond within the three seconds, the researcher then provided the participant with the echoic prompt. If the participant said an acceptable answer for the emotion that correctly matched the situation depicted in the animated video before the prompt had been given, the answer was scored as an independent correct answer on the Data Collection Form, and the positive feedback procedure was used. If the participant said an acceptable answer for the emotion that correctly matched the situation depicted in the animated video after the prompt had been given, the answer was scored as a prompted correct answer on the Data Collection Form, and the positive feedback procedure was used. If the participant said the incorrect emotion prior to receiving the prompt, the answer

was scored as an independent incorrect answer on the Data Collection Form, and the error correction procedure was used. If the participant said the incorrect emotion or did not make a response within 10 seconds after the prompt had been given, the answer was scored as a prompted incorrect answer, and the error correction procedure was used. Following these procedures, the next animated video was pulled up on the iPad® and the next sub-trial started, until all 20 sub-trials were completed. Participants were required to reach the mastery criteria of 80% correct or above in at least three trials before eligible to move into the next phase. The phase was to be discontinued if the participant had not met mastery criteria after ten trials, and the participant was to be automatically moved into the next phase; however, this was never the case.

No Prompt Phase

Following the 3-second prompt delay phase, the no prompt phase was implemented. Prior to beginning each trial within the no prompt phase, the researcher stated, “This time, I am not going to give you the right answer, so when I ask you how the boy or girl feels, I just want you to try your best!”. Within each trial of the no prompt phase, participants again completed twenty sub-trials using all 20 animated videos. The no prompt phase consisted of the same procedure as described above in the 3-second prompt delay phase: that is, each sub-trial consisted of the researcher showing participants one randomized animated video on the iPad and asking how the main character felt at the end. However, there was no prompting procedure used during this phase, similar to baseline conditions. During each sub-trial of this phase, the researcher showed participants the animated video and asked how the main character felt. If the participant said an acceptable answer for the emotion that correctly matched the situation depicted in the animated video, the answer was scored as an independent correct answer on the Data Collection Form, and

the positive feedback procedure was used following the above script. If the participant said the incorrect emotion or did not make a response within 10 seconds, the answer was scored as an independent incorrect answer on the Data Collection Form. The error correction procedure as described above in previous phases was not used during the no prompt phase. Following these procedures, the next animated video was pulled up on the iPad® and the next sub-trial began, until all 20 sub-trials were completed. Because the no prompt phase did not use the prompting procedure or the error correction procedure, this phase was useful to the researchers in examining the participants' independent abilities to label the correct emotions with the situations depicted in the animated videos.

Design and Data Analyses

A multiple baseline design across participants was used to evaluate the effects of antecedent response prompts on participants' abilities to correctly label the emotions of main characters in animated video situations. Unit randomization was used to randomize the order that participants were exposed to the independent variable (i.e., who Participant 1 would be, who Participant 2 would be, etc.; Levin et al., 2014). For the current study, data on the percentage of correct answers per trial was graphed across participants using the multiple baseline design. Possible data points for percentage of correct answers included anything ranging from 0% to 100% in 5% increments, because each trial included 20 sub-trials.

The data analyses primarily included visual analysis of data patterns to identify changes in level, trend, variability, overlap, immediacy of change, and consistency of patterns across similar phases. Visual analysis of data aids researchers in determining whether evidence of a relation between an independent variable and an outcome variable exists, as well as determining the strength or magnitude of that relation (Kratochwill, 2010). In addition to visual analysis, the

researchers calculated nonoverlap of all pairs (NAP), as outlined by Parker and Vannest (2009), as an additional measure of effect. According to Parker and Vannest (2009), NAP is an effective method for calculating effect sizes as compared to other common procedures (e.g., percent of nonoverlapping data, percent of all nonoverlapping data). NAP determines the amount of overlap between baseline, control, or withdrawal conditions to treatment conditions. The procedure compares each individual datum point in one condition (e.g., baseline) to each datum in the subsequent condition (e.g., 0-second prompt delay phase). Therefore, NAP scores were calculated between baseline and the 0-second prompt delay phase, baseline and the 3-second prompt delay phase, and baseline and the no prompt phase. NAP scores between 0 – 0.65 are considered weak, 0.66 – 0.92 are moderate, and 0.93 – 1.00 are large (Parker & Vannest, 2009).

To further analyze the data and to address the second research question, the researcher also broke down each participant's results by emotion across all phases to determine if procedures were more effective in teaching certain emotions over others. To do so, a bar graph was created for each participant showing a breakdown of percentage correct across the four studied emotions across all four phases. These data were primarily analyzed via visual analysis and descriptive statistics.

CHAPTER IV

RESULTS

The current study sought to determine if the use of animated videos with constant time delay prompt procedures would increase participants' abilities to label situation-specific emotions. To evaluate the effectiveness of these procedures, data across all participants and phases were graphed in Figure 1. Figure 1 shows the percentage of correctly identified emotions across baseline, the 0-second prompt delay phase, the 3-second prompt delay phase, and the no prompt phase for participants 1, 2, and 3. Visual analysis of level, trend, variability, overlap, immediacy of change, and consistency of patterns across similar phases was the primary method for interpretation of results (Kratochwill et al., 2010).

Research Question #1

During baseline, the percentage of correctly labeled emotions remained at a low level across all three participants. Participant 1's percentage of correctly labeled emotions remained at a stable, low level around 20-30% with no trend during baseline. Participant 2's data remained stable across all of baseline, as he did not label any emotions correctly during this phase. Participant 3's percentage of correctly labeled emotions also remained at a stable, low level around 0-10% with no trend during baseline. Upon moving into the 0-second prompt delay phase, even though each participant moved into this phase at a different time, each saw an immediate and significant increase in level of correctly labeled emotions, ranging from about 90-100% correct during this phase. All three participants' data were stable and showed a gradual

increase in trend across trials during the 0-second prompt delay phase. Additionally, all three participants' data in the 0-second prompt delay phase showed no overlap with data from their baseline.

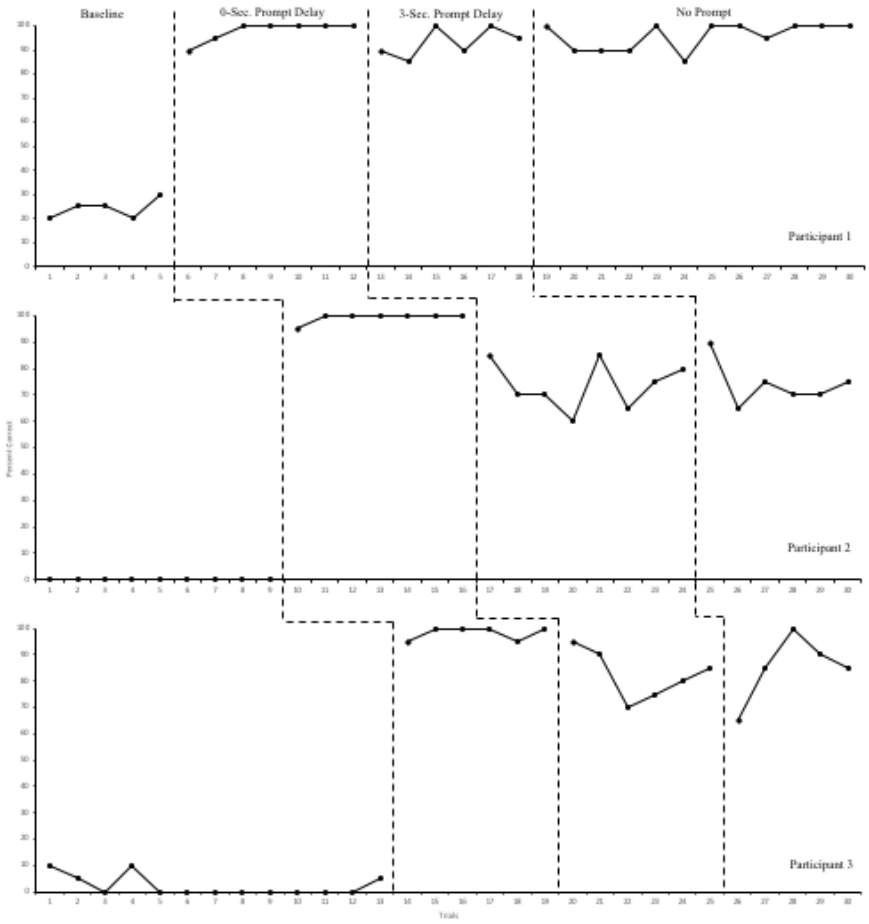

Figure 1. *Percentage of correctly labeled emotions across participants and phases.* The above figure displays the percent of correctly labeled emotions across Participants 1, 2, and 3 in baseline, the 0-second prompt delay phase, the 3-second prompt delay phase, and the no prompt phase.

When participants were moved into the 3-second prompt delay phase at different times, each participant showed a slight decrease in level from the 0-second prompt delay phase. Participant 1's percentage of correctly labeled emotions remained stable and showed a gradual

increase in trend and level across trials of the 3-second prompt delay phase, with the level at the end of the phase being consistent with the level found during his 0-second prompt delay phase. Participant 2's percentage of correctly labeled emotions showed a more significant decrease in level than Participants 1 and 3 when moved into the 3-second prompt delay phase. Although Participant 2's data were slightly variable during this phase, there was no trend and the data remained at a lower level than data from his 0-second prompt delay phase. Participant 3's correctly labeled emotions during the 3-second prompt delay phase showed a decreasing trend for the first few trials, but then showed an increasing trend during the last trials of the phase. Although each participant saw a slight decrease in level from the 0-second prompt delay phase to the 3-second prompt delay phase, there was still no overlap between all participants' data in this phase as compared to baseline.

Upon entering the last phase, the no prompt phase, each participants' data remained at a consistent level as seen previously in their 3-second prompt delay phase. Participant 1's data showed a slightly increasing trend and remained stable across trials. Participant 2's correctly labeled emotions immediately decreased after the first trial of the no prompt phase, and the remainder of trials during this phase showed a slightly increasing trend. Participant 3's data immediately decreased when moved into the no prompt phase but showed an increasing trend over the first few trials of the phase. The last few trials of Participant 3's no prompt phase showed a slightly decreasing trend. Again, there was no overlap between all participants' data in the no prompt phase as compared to baseline.

Effect Size

In addition to visual analysis, NAP effect sizes were also calculated to evaluate overlap between phases as compared to baseline. NAP effect sizes for each participant can be found in

Table 1. NAP scores were calculated between baseline and the 0-second prompt delay phase, baseline and the 3-second prompt delay phase, and baseline and the no prompt phase for each participant. All effect sizes were found to be 1.00, indicating all large effect sizes. This suggests that Participants 1, 2, and 3 all had no overlap, and therefore, large effects from baseline to the 0-second prompt delay phase, from baseline to the 3-second prompt delay phase, and from baseline to the no prompt delay phase.

Table 1

NAP Effect Sizes Across Participants and Phases

Participants	**BL – 0 Second**	**BL – 3 Second**	**BL – No Prompt**
Participant 1	1.00*	1.00*	1.00*
Participant 2	1.00*	1.00*	1.00*
Participant 3	1.00*	1.00*	1.00*

The above table displays NAP effect sizes for Participants 1, 2, and 3 between baseline and the 0-second prompt delay phase, baseline and the 3-second prompt delay phase, and baseline and the no prompt phase. The * denotes a large effect size.

Research Question #2

Finally, the current study also sought to determine if using animated videos and systematic prompt delay procedures would be more effective in teaching certain emotions over others. To further evaluate differences in the effectiveness of the current procedures across different emotions, the percentage of correctly labeled emotions for each participant was evaluated by breaking down results of each studied emotion across all phases. Figures 2, 3, and 4 display these results for Participants 1, 2, and 3, respectively.

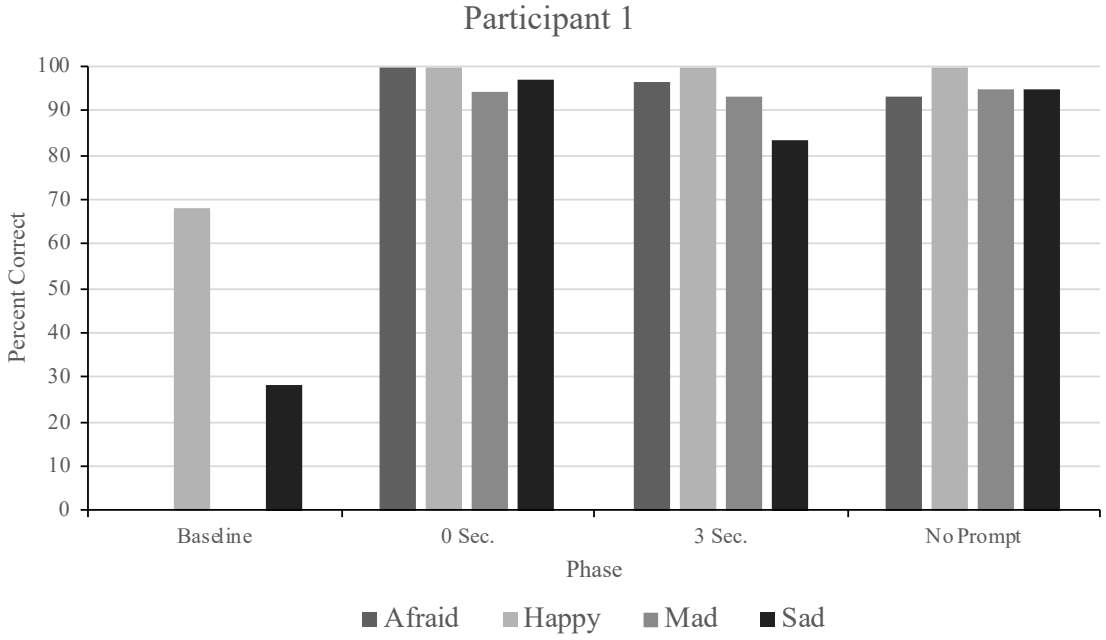

Figure 2. *Participant 1's percentage of correctly labeled emotions across phases broken down by emotion.*

The above figure displays Participant 1's percent of correctly labeled emotions across baseline, the 0-second prompt delay phase, the 3-second prompt delay phase, and the no prompt phase broken down by emotion.

During baseline, Participant 1 labeled an average of 68% of happy situations correctly and an average of 28% of sad situations correctly; Participant 1 did not label any afraid or mad situations correctly during baseline. During the 0-second prompt delay phase, Participant 1 labeled 100% of afraid and happy situations correctly, an average of 97% of sad situations correctly, and an average of 94% of mad situations correctly. During the 3-second prompt delay phase, Participant 1 continued to label 100% of happy situations correctly, and he labeled an average of 97% of afraid situations correctly and 93% of mad situations correctly. During this phase, the average of sad situations labeled correctly by Participant 1 decreased to an average of 83%. Lastly, during the no prompt phase, Participant 3 continued to label 100% of happy

situations correctly, and he labeled an average of about 95% of afraid, mad, and sad situations correctly.

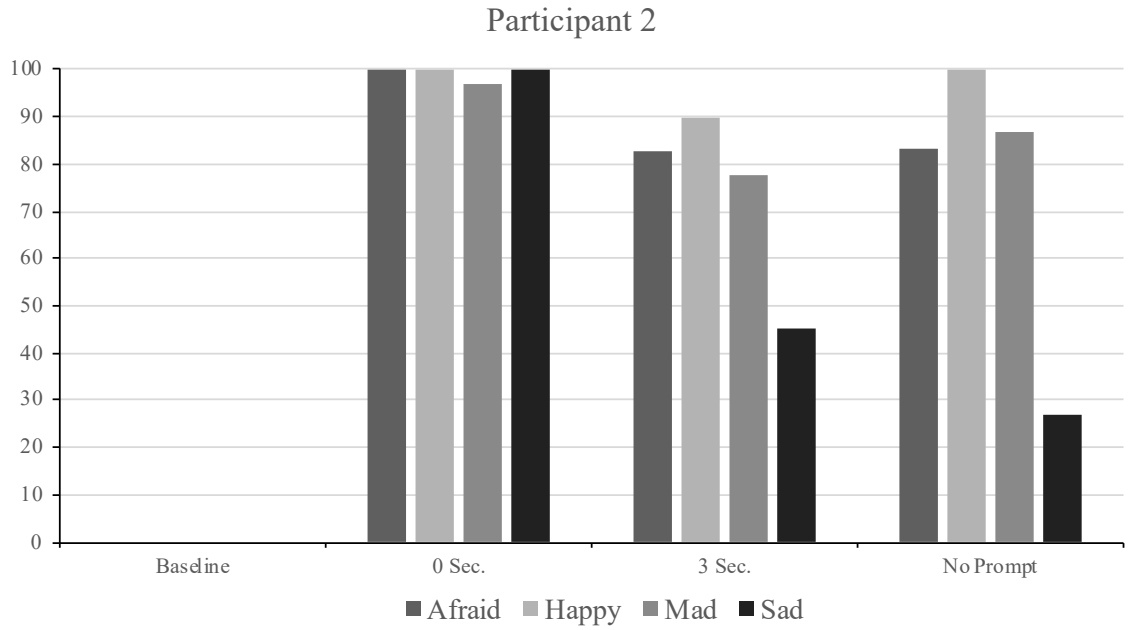

Figure 3. *Participant 2's percentage of correctly labeled emotions across phases broken down by emotion.*

The above figure displays Participant 2's percentage of correctly labeled emotions across baseline, the 0-second prompt delay phase, the 3-second prompt delay phase, and the no prompt phase broken down by emotion.

During baseline for Participant 2, no situations were labeled correctly. During the 0-second prompt delay phase, Participant 2 labeled 100% of afraid, happy, and sad situations correctly, while he labeled an average of 97% of mad situations correctly. During the 3-second prompt delay phase, Participant 2 labeled an average of 90% of happy situations correctly, an average of 83% of afraid situations correctly, and an average of 78% of mad situations correctly. During this phase, the average of sad situations labeled correctly by Participant 2 decreased to an average of 45%. Lastly, during the no prompt phase, Participant 2 labeled 100% of happy

situations correctly and continued to label an average of 83% of afraid situations correctly. During this phase, the average of mad situations labeled correctly by Participant 2 increased to an average of 87%, while the average of sad situations labeled correctly decreased to an average of 27%.

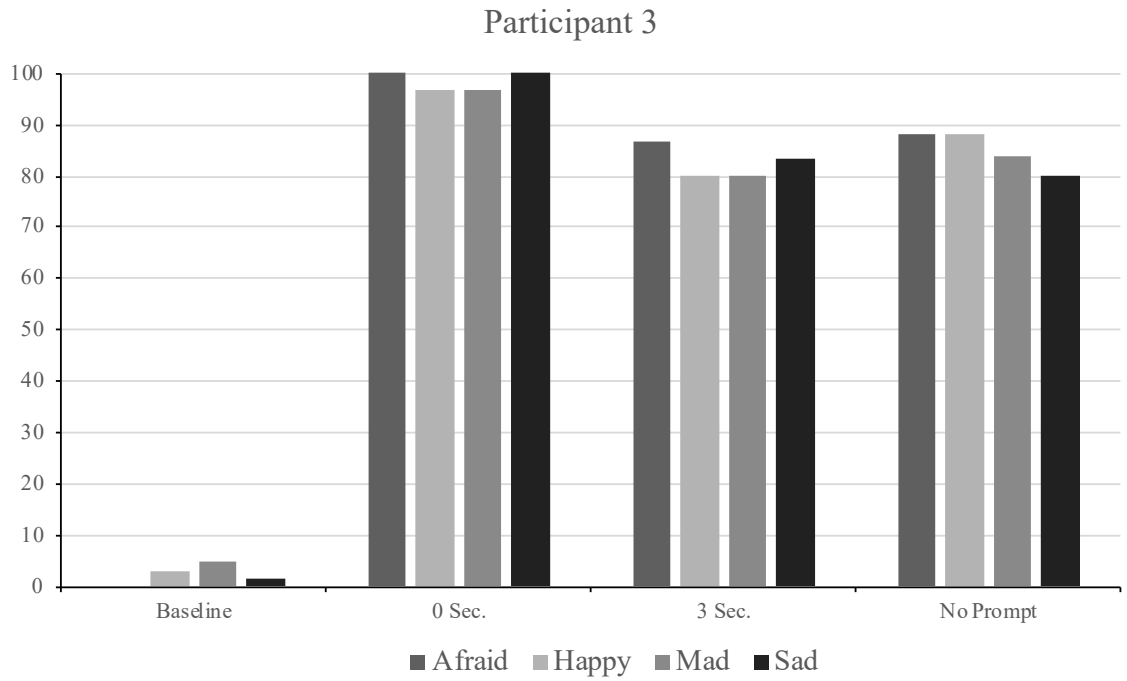

Figure 4. *Participant 3's percentage of correctly labeled emotions across phases broken down by emotion.*

The above figure displays Participant 3's percentage of correctly labeled emotions across baseline, the 0-second prompt delay phase, the 3-second prompt delay phase, and the no prompt phase broken down by emotion.

Participant 3 labeled an average of 5% of mad situations, an average of 3% of happy situations, and an average of 2% of sad situations correctly during baseline; Participant 3 did not label any afraid situations correctly during this phase. During the 0-second prompt delay phase, Participant 3 labeled 100% of afraid and sad situations correctly, while he labeled an average of

97% of happy and mad situations correctly. During the 3-second prompt delay phase, Participant 3 labeled an average of 87% of afraid situations and an average of 83% of sad situations correctly, while he labeled an average of 80% of both happy and mad situations correctly. Lastly, during the no prompt phase, Participant 3 labeled an average of 88% of afraid and happy situations correctly, while he labeled an average of 84% of mad situations and an average of 80% of sad situations correctly.

CHAPTER V

DISCUSSION

The purpose of the current study was to extend the previous literature on effective strategies for teaching the ability to label situation-based emotions. The current study sought to do this by exploring a procedure combining multiple elements used in previous research studies in order teach individuals with ASD the ability to label situation-based emotions. The combined elements included animated videos depicting the emotions of happy, sad, angry, and afraid, as well as prompt delay procedures, error correction procedures, and reinforcement procedures. The prompt delay, error correction, and reinforcement procedures used in the current study are similar to those used in McHugh et al.'s (2011), Conallen and Reed's (2016), and Schmick et al., (2018) studies. The animated videos used in the current study combined elements of the puppet videos used in McHugh et al.'s (2011) study with the cartoon illustrations used in Conallen and Reed's (2016) study, as well as the real-life videos depicting differing situations used in Schmick et al.'s (2018) study.

Overall, the results suggest that the combination of procedures used in the current study were effective in teaching individuals with ASD to label situation-specific emotions. Current study participants exhibited minimal to no skills in labeling the situation-specific emotions of others prior to receiving intervention. However, by the last phase of the study, participants were able to correctly label an average of 88% of situation-specific emotions independently, without prompts. These findings support the findings of Conallen and Reed (2016), McHugh et al.

(2011), and Schmick et al. (2018) in that individuals with ASD can be strategically taught to label the emotions of others without the ability to do so previous to intervention. Additionally, these findings extend the previous literature by suggesting that multiple elements used in previous research studies, namely prompt delay procedures, error correction procedures, and reinforcement procedures, can be combined to create an effective intervention package.

Further, although previous studies targeting this skill have used certain elements similar to animated videos, such as cartoon illustrations (Conallen & Reed, 2016), puppet videos (McHugh et al., 2011), and real-life videos (Schmick et al., 2018), the current study was the first study to explore using animated videos specifically in an intervention to teach individuals with ASD the ability to label situation-specific emotions. According to Ho, Gadke, Henington, Evans-McCleon, and Justice (2019), using animated videos in video modeling interventions minimizes the need for technical knowledge and specialized video equipment and software through the application of easy-to-use online programs. Many online programs used in making animated videos require only basic computer skills, offer quick templated models, and include readily available step-by-step instructions and tutorials. Further, animated videos allow the user to type in specific scripts and create age- and gender-matched models (Ho et al., 2019). Therefore, this information, combined with the results of the current study, suggest that animated videos are a viable and effective option to use in interventions targeting individuals' with ASD ability to label situation-specific emotions.

The current study additionally sought to determine if the intervention package would be more effective in teaching certain emotions over others, similar to a research question of McHugh et al. (2011) and Conallen and Reed (2016). Both McHugh et al. (2011) and Conallen and Reed (2016) found that there were no significant differences between participants' baseline

recognition of happy, sad, mad, and afraid, and there were no significant differences between these emotions after intervention, as both studies showed effective results across all of the emotions studied. However, previous research has indicated that individuals with ASD show the most apparent deficits for recognizing basic emotions with negative valence (Ashwin et al., 2006; Humphreys et al., 2007). Ashwin et al. (2006) found that individuals with ASD were less accurate than their typically developing peers in recognizing the negative emotions of fear, disgust, anger, and sadness, while no group differences between the participants with ASD and the typically developing control participants were found for recognition of the non-negative emotions of happy, surprise, and neutral; Humphreys et al. (2007) found similar results.

In the current study, researchers found similar results to Ashwin et al. (2006) and Humphreys et al. (2007) in participants' baseline abilities to label the emotions of happy, sad, mad, and afraid. Participant 1 did not label any afraid or mad situations correctly during baseline; likewise, Participant 2 did not label any afraid situations correctly and labeled minimal sad situations correctly during baseline. Participant 3 did not label any situations correctly during baseline. These results suggest that for the participants who were able to label any emotions correctly during baseline, the negative valence emotions (i.e., mad, sad, and afraid) seemed more difficult to label than the positive emotion (i.e., happy), supporting the research findings of Ashwin et al. (2006) and Humphreys et al. (2007).

Additionally, during the last phase of the current study, which involved no prompts and was used to measure each participants' ability to label the situation-specific emotions independently, Participants 2 and 3 labeled the lowest percentage of sad situations correctly; similarly, Participant 1 labeled the lowest percentage of afraid situations correctly during the last phase. Further, all three participants labeled the highest percentage of happy situations correctly

during the last phase of the current study. These results suggest that, although the intervention showed to be effective at teaching all three participants the ability to label situation-specific emotions as compared to baseline, it appears that all three participants showed more significant deficits in labeling the emotions of negative valence as opposed to the positive emotion. Again, these findings support the results of Ashwin et al. (2006) and Humphreys et al. (2007).

Limitations and Future Research

Although the researchers of the current study believe the results to be both reliable and valid, the study was not without limitations. While the researchers used both unit randomization and start point randomization to establish more control in their study design, the start point randomization interfered with meeting multiple baseline design evidence standards as set by Kratochwill et al. (2010) due to the mastery criteria set for the 0-second and 3-second prompt delay phases. All phase start points for all participants were randomized prior to beginning the study. However, the 0-second and 3-second prompt delay phases both had mastery criteria of at least 80% in three total trials. In the event that the participant had not met mastery criteria prior to the trial that randomization determined should be the start point of the next phase, the primary researcher continued through the previous phase until the participant met mastery criteria.

This was the case for Participant 2 during the 3-second prompt delay phase. Participant 2 was randomized to start the no prompt phase during trial 22. However, Participant 2 did not meet mastery criteria until trial 24, so he was therefore moved into the no prompt phase during trial 25. Because start points were randomized prior to the beginning of the study, participant 3 was moved into the no prompt phase in trial 26. This meant that, instead of having at least 3 overlapping data points before the next participant moved into the next phase (meeting multiple baseline design standards; Kratochwill et al., 2010), Participants 2 and 3 only had one

overlapping data point before Participant 3 was moved into the no prompt phase. However, looking at the data as a whole, the researchers were still able to establish control and conclude that the intervention package was effective for all participants.

A second limitation of the current study was the uneven balance of negative and positive valence emotions examined. In the current study, the researchers examined three negative valence emotions (i.e., sad, angry, and afraid) and one positive valence emotion (i.e., happy). Likewise, McHugh et al. (2011) examined happy, sad, angry, and afraid, and Conallen and Reed (2016) examined happy, sad, and angry. The current study's results suggested that participants seemed to have a more difficult time labeling the negative valence emotions, supporting the findings of Ashwin et al. (2006) and Humphreys et al. (2007). However, participants had more opportunities to label these negative emotions, as three of the four emotions examined were negative in nature. Future research should attempt to examine an even amount of positive and negative emotions to give participants the equal opportunity to label both categories of emotions. Further, future research should examine novel positive and negative emotions that have not previously been studied in this context, including disgust, grief, love, surprise, excitement, and more.

Another limitation was the lack of a generalizability phase or follow up conducted after the conclusion of the study. Without generalization or follow up, it is hard to say that the results of the study could be generalized to other settings, participants, emotions, or situations, or that the results could be held up over time. Future research should focus on this area. Future studies should examine how effectively the intervention package generalizes to novel emotions and situations depicted by novel animated videos. Further, future studies should focus on other age groups of individuals with ASD to examine if results generalize to these participants as well.

Another area that generalizability could focus on in future research is whether the current intervention package gives participants the ability to generalize the labeling of other's situation-specific emotions to their own situation-specific emotions. Along these lines, future research should also examine the ability of participants to generalize these skills to their own real-life situations and interactions. Finally, future research should add a follow up component to determine if these results can be maintained after the conclusion of the intervention.

Implications

Social interaction impairments are one of the primary features of ASD (APA, 2013; Fishman et al., 2014; Ratcliffe et al., 2014; Smith et al, 2010). The social deficits experienced by individuals with ASD impact their ability to successfully interact with same-age peers and adults, which leads to several negative outcomes, such as feelings of loneliness and social isolation (Ahlers et al., 2017; Lipscomb et al., 2017). Baron-Cohen and colleagues (1985) identified recognizing and labeling situation-specific emotions as a key problem area for children with ASD at the root of their social deficits. The results of the current study implicate that the ability to label emotions can be taught to individuals with ASD who did not previously possess this skill. With early intervention, these learned skills could help decrease the gap in social skills between individuals with ASD and their typically developing peers. Additionally, acquiring these skills could assist individuals with ASD in better understanding the social world around them. Psychologists working with children with ASD should continuously strive to identify the most effective and efficient interventions in identifying emotions.

Conclusions

Research has indicated that individuals with ASD have deficits in the ability to correctly identify and interpret the emotions and feelings of others. The ability to recognize the emotions of others is extremely beneficial in a number of ways, whereas the inability to recognize the emotions of others has been linked to inappropriate behaviors, as well as mental health, personal, social, and academic difficulties. The purpose of the current study was to extend the previous literature on effective strategies for teaching individuals with ASD to correctly label the situation-based emotions of others. Overall, the current study's results suggest that an intervention package combining animated videos with prompt delay, error correction, and reinforcement procedures was effective in teaching participants the ability to label situation-specific emotions. Additionally, the current study's results also supported the idea that individuals with ASD have stronger deficits in recognizing negative emotions, such as sad, mad, and afraid, as compared to positive emotions, such as happy. Future research should continue to focus on exploring the generalization and maintenance of these results.

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APPENDIX A

RECRUITMENT FLYER

DOES YOUR CHILD HAVE AUTISM AND HAVE DIFFICULTY UNDERSTANDING EMOTIONS?

SEEKING PARTICIPANTS!!

We are currently recruiting **three children** to participate in a dissertation study. This study will examine the effects of an evidence-based intervention designed to enable children to label the emotions of others. The study should be completed over one four-hour session with each participant.

The **benefits** of participating in this study include: (1) increasing the participant's exposure to training in the ability of recognizing the emotions of others, (2) increasing the participant's ability to label situation-specific emotions of others, and (3) gaining understanding of the participant's current abilities to understand emotions.

Specific criteria to participate include: (1) child is between the ages of 5 years 0 months and 9 years 11 months, (2) child has a diagnosis of Autism Spectrum Disorder, (3) child does not have any major behavioral concerns that will hinder the child's ability to participate in sessions, (4) child is able to attend towards and view a ten second video, (5) child has adequate vocal abilities to be able to say the names of the tested emotions, and (6) child has reported deficits in understanding emotion.

More specific details will be discussed once you contact the researcher. Please contact the primary researcher (Margaret Powell) via email at mlb620@msstate.edu if you are interested in participating. The faculty advisor for the study is Dr. Dan L. Gadke (dgadke@colled.msstate.edu). Thank you!

APPENDIX B

DEMOGRAPHIC QUESTIONNAIRE

Demographic Questionnaire

Parent/Guardian's Name: _____

Child's Name: _____

Child's Date of Birth: _____

Child's Grade: _____

Who diagnosed your child with Autism Spectrum Disorder? (educational or medical setting):

_____

When? (year or age of diagnosis is fine): _____

1. Race of Child
   - ☐ African American
   - ☐ Asian American
   - ☐ Caucasian
   - ☐ Hispanic
   - ☐ Native American
   - ☐ Other: _____

2. Gender of Child
   - ☐ Male
   - ☐ Female

3. Does your child have another diagnosis aside from ASD? (Check all that apply)
   - ☐ ADHD
   - ☐ Anxiety
   - ☐ Conduct Disorder
   - ☐ Depression
   - ☐ Intellectual Disability
   - ☐ Oppositional Defiant Disorder
   - ☐ Selective Mutism
   - ☐ Social (Pragmatic) Communication Disorder
   - ☐ Specific Learning Disability
   - ☐ Stereotypic Movement Disorder
   - ☐ Other: _____
   - ☐ N/A

4. Check the appropriate box to indicate your child's special education ruling.

- ☐ Autism (AU)
- ☐ Deaf/Blind (DB)
- ☐ Developmentally Delayed (DD)
- ☐ Emotional Disability (EmD)
- ☐ Hearing Impairment (HI)
- ☐ Intellectual Disability (ID)
- ☐ Language or Speech Impairment (LS)
- ☐ Multiple Disabilities (MD)
- ☐ Orthopedic Impairment (OI)
- ☐ Other Health Impairment (OHI)
- ☐ Specific Learning Disability (SLD)
- ☐ Traumatic Brain Injury (TBI)
- ☐ Visually Impaired (VI)
- ☐ N/A

5. Check the appropriate box to indicate your child's placement in the school setting.
   - ☐ General Education
   - ☐ Inclusion into General Education with Special Education Support Services
   - ☐ Self-Contained

6. Is your child able to label their own emotions (e.g., happy, sad, mad, scared, etc.)?
   - ☐ Yes
   - ☐ No

7. Is your child able to label the emotions of others (e.g., happy, sad, mad, scared, etc.)?
   - ☐ Yes
   - ☐ No

8. Does your child have any major behavioral concerns (e.g., tantrums, non-compliance, aggression)?
   - ☐ No
   - ☐ Yes
     If yes, please explain: _____

9. Does your child have concerns with any of the following?
   - ☐ Hearing
   - ☐ Vision
   - ☐ Echolalia (repetition or echoing of another person's words)
   - ☐ None
     If you checked anything, please explain:
     _____

10. How many words does your child say independently?
    - ☐ 0 to 10
    - ☐ 10 to 20

☐ 20 to 50
☐ > 50

11. Check all appropriate boxes below to indicate your child's most preferred items/activities.
    - ☐ Animal toys (e.g., farm animals, dinosaurs)
    - ☐ Board games
    - ☐ Building blocks
    - ☐ Candy/snacks
    - ☐ Cars/trucks/planes/trains
    - ☐ Drawing/coloring/crafts
    - ☐ iPad/computer/video games
    - ☐ Puzzles
    - ☐ Other: _____

    Of those checked, rank your child's top three most preferred items/activities (1 being the highest).

    1. _____
    2. _____
    3. _____

APPENDIX C

VIDEO SCRIPTS

Happy Videos

The boy sees his friends.

- The boy enters the scene at a park.
    - The boy's three friends (two males and one female) are all standing together.
- The boy looks at his friends, points towards them, and states, "Oh look! It's my friends!".
- The boy waves his hand and says, "Hey friends!".
- The three friends wave back to the boy and say altogether, "Hey!".

The girl's favorite food is for dinner.

- The girl enters the scene in a kitchen.
    - The girl's mother is standing at the kitchen counter putting together a salad.
- The girl says, "Hey mom! What's for dinner?".
- The mother replies, "Salad, spaghetti with meatballs, and brownies for dessert".
- The girl fist pumps in excitement while saying, "Awesome! That's my favorite!".

The boy's favorite baseball player hit a homerun.

- The beginning scene shows two baseball players and an umpire on the field of a baseball stadium.
    - One player is at bat, one is playing catcher, and the umpire stands behind the catcher.
- A ball is pitched to the player at bat, and the player swings and hits the ball.
- The next scene shows the baseball leaving the stadium while fireworks explode and the crowd cheers.
- The camera then zooms into the boy sitting in the crowd.
- The boy states, "Wow! My favorite player just scored a homerun!".

The girl's mom bought her a puppy.

- The girl is sitting on the ground in a backyard playing with a doll.
- The mother enters the scene walking a dog.
- The mother says to the girl, "Look what I bought you today! Her name is Rosie".
- The girl stands up and skips over to the dog.
- When the girl reaches the dog, she stops and says, "Hi Rosie!".

School has finished for the day.

- The beginning scene shows a classroom with four students sitting at a table (three males and one female) with their teacher standing in front of them at the chalkboard.
- The teacher says to the students, "Make sure to write down your answers".
- The school bell starts ringing in the background.
- The teacher says, "There's the bell! It's time to go home".
- The next scene shows the outside of the school building.

- Three students are shown walking towards the school bus.

Sad Videos

The girl's dog died.

- The girl, the girl's mother, and the girl's father are waiting in a room at a veterinary's office.
  - The girl is sitting down while her parents are standing behind her.
- The veterinary enters the scene.
- The veterinary tells the girl and her parents, "I'm sorry to say that your dog, Rosie, has died.
- The girl's and her parents' mouths all open in shock.
- The girl states, "Oh no! Not Rosie!" while her parents put their arms around each other.

The boy's friends won't let him play with them.

- The boy enters the scene at a playground.
  - The boy's three friends (two males and a female) are all playing at the playground. One is playing with a toy car, one is playing in the sand, and one is on a slide.
- The boy waves and says, "Hey friends! Can I play with you?".
- The friend who is playing with the toy car replies, "No! We don't want to play with you".
- The boy says back, "Oh, okay".

The girl's balloon burst.

- The girl and her mother are standing on a sidewalk outside of a building.
- The girl's mother says to the girl, "Here you go! Here is a balloon for you".
  - The girl is clapping while her mother says this.
- The mother gives the girl the balloon.
- The balloon pops and disappears.
- The girl states, "Oh no! My balloon!".

It rains on the boy's picnic.

- The boy and his friend (a female) are sitting on a blanket in a park with a picnic basket.
  - The sky is bright blue.
- The boy states, "What a perfect day for a picnic!".
- The sky turns a blue/grey color and thunder sounds.
- The sky turns grey and rain begins to fall.
- The boy and girl both say, "Oh no!" at the same time.

It's the girl's birthday, but she is sick.

- The girl is lying in her bed with a sick look on her face.
  - The girl's mother and father are standing beside the girl's bed.
  - The girl's mother is holding balloons.
- The mother says to the girl, "Wake up honey! It's your birthday!".
- The father says to the girl, "We've got to get ready for your birthday party!".

- The girl replies, “I don’t feel well. I think I’m sick”.
- The mother and father both say, “Oh no!” at the same time.

Mad Videos

The boy’s dog leaves muddy footprints on the clean floor.

- The boy and his sister are playing on the floor of a living room.
    - The boy is playing with a toy car and the girl is playing with a toy bear.
- A dog runs past them quickly and leaves a trail of dirt behind on the floor.
- The boy and girl stop playing with their toys.
- The boy says, “Max! You got mud all over the clean floor!”.

The girl’s brother ate all of her cookies.

- The girl, the girl’s brother, the girl’s mother, and the girl’s father are all sitting at a table eating dinner together.
    - The brother, mother, and father all have food on their plate, but the girl’s plate is empty.
- The girl says to her mother, “I finished all of my dinner. Now can I eat my cookies for dessert?”.
- The mother replies, “Yes you may! Go get the box out of the kitchen”.
- The girl walks out of the scene.
- The girl returns to the scene holding a box.
- The girl states, “There aren’t any cookies left! My brother ate them all!”.

The kids run over the boy’s sandcastle.

- The boy is building a sandcastle on a beach while his parents sunbathe in lounge chairs.
- Three children run past the boy and his parents.
    - One child is chasing two other children.
    - The children being chased scream as they run by the boy.
- The boy is knocked over and his sandcastle disappears.
- The boy exclaims, “Ugh! They ran over my sandcastle!”.

A boy pushes the girl out of the way.

- The girl and her two friends (one male and one female) are talking in a school hallway.
- A boy enters the scene and walks up to the girl.
- The boy says to the girl, “Get out of my way!”.
- The boy pushes the girl, and the girl falls to the ground.
- The girl says, “Ugh!” while the boy walks out of the scene.

Someone went in the boy’s room and messed up his things.

- The boy enters the scene in a bedroom.
    - The bedroom is messy. There are clothes, toys, and garbage all over the floor and bed.
- The boy puts his hands on his hips, and then crosses his arms.

- The boy states, “Ugh! Someone was in my room and messed up all of my things!”.

Afraid Videos

The girl sees a big spider.

- A teacher is sitting at her desk in a classroom reading a book.
  - There is a large spider web and spider on the desk that the teacher cannot see.
- The girl enters the scene.
  - The teacher puts the book down and looks at the girl.
- The girl says to the teacher, “Miss Smith, I have a question about our homework.
- The girl then points at the spider and spiderweb and screams.
- The girl then exclaims, “A spider!”.

The boy is watching a movie about monsters.

- The beginning scene shows people in a movie theater watching a movie.
  - The people in the movie theater are sitting in movie theater seats and looking towards the screen.
- The next scene shows the movie screen that the people are watching.
  - A large growling, scary monster is shown on the movie screen.
- The next scene goes back to showing the people sitting in the theater watching the movie.
- The camera then zooms into one of the boys in the crowd.
  - The boy’s mouth is open.
- The boy screams.

The girl sees a big mean dog.

- The girl enters the scene in a park.
  - The girl is skipping when she enters the scene.
  - A large dog is standing in the park.
- The girl says to the dog, “Hi dog! You look nice!”.
- The dog begins barking loudly.
- The girl screams and runs out of the scene.

The boy is caught in a thunderstorm and sees lightning.

- The boy enters the scene on a walking trail in the forest.
  - The sky is grey.
- Rain starts falling and the boy says, “Oh no! It’s starting to rain”.
- The boy pulls out an umbrella and smiles.
- Thunder cracks and lightning strikes.
- The boy screams and runs out of scene.

The girl sees a big snake.

- The boy and his sister are sitting around a campfire right next to their tent in the woods.
- The girl says to her brother, “I love camping!”.

- The boy stands up and points towards the ground.
- The boy says to his sister, “Look! A snake!”.
- The girl stands up, screams, and runs out of scene.

APPENDIX D

ACCEPTABLE ANSWERS

Happy
Happy
Glad
Joyful
Over-the-moon

Sad
Sad
Upset
Down
Down-in-the-dumps

Mad
Mad
Angry
Furious
Fuming

Afraid
Afraid
Scared
Frightened
Fearful

APPENDIX E

DATA COLLECTION FORM

Date:	Participant #:	Trial #:
Phase: **Baseline** **0-Second** **3-Second** **No Prompt**		

Sub-trial Number	Randomized Video Code	Participant Answer	Correct (+) or Incorrect (-)	Prompted (P) or Independent (I)
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				

APPENDIX F

TREATMENT INTEGRITY FORMS

Baseline Treatment Integrity

Date:	**Participant #:**	**Trial Number:**
Observer:		

Step #:	**Task:**	**Check if Occurred:**
1	Randomize order of the 20 animated videos	
2	Show each video one at a time based on the randomized order	
3	At the end of each video, point to main character or place where main character exited scene	
4	Ask “How does he/she feel?”	
5	Record the participant’s answer	
6	Record whether the answer was correct or incorrect	
7	Record whether the answer was prompted or independent (should be independent)	
8	Do not provide the participant with positive feedback or error correction	
9	Repeat these procedures until all 20 animated videos have been shown	

Notes:

0-Second Prompt Delay Phase Treatment Integrity

Date:	**Participant #:**	**Trial Number:**
Observer:		

Step #:	**Task:**	**Check if Occurred:**
1	Randomize order of the 20 animated videos	
2	Show each video one at a time based on the randomized order	
3	At the end of each video, point to main character or place where main character exited scene	
4	Ask “How does he/she feel?”	
5	Immediately provide an echoic prompt with a 0 second time delay (e.g., “Say happy”)	
6	Record the participant’s answer	
7	Record whether the answer was correct or incorrect	
8	Record whether the answer was prompted or independent (should be prompted)	
9	If correct, provide verbal praise (e.g., “Yes, good job! The boy is happy because his favorite player hit a homerun!”)	
10	If incorrect, provide error correction (e.g., “No, that’s not quite right! The boy is happy because his favorite player just hit a homerun. Say happy!”)	
11	Repeat these procedures until all 20 animated videos have been shown	

Notes:

3-Second Prompt Delay Phase Treatment Integrity

Date:	Participant #:	Trial Number:
Observer:		

Step #:	Task:	Check if Occurred:
1	Randomize order of the 20 animated videos	
2	Show each video one at a time based on the randomized order	
3	At the end of each video, point to main character or place where main character exited scene	
4	Ask “How does he/she feel?”	
5	Wait 3 seconds for an answer	
6	If no answer, provide echoic prompt after the 3 second delay (e.g., “Say happy”)	
7	Record the participant’s answer	
8	Record whether the answer was correct or incorrect	
9	Record whether the answer was prompted or independent	
10	If correct, provide verbal praise (e.g., “Yes, good job! The boy is happy because his favorite player hit a homerun!”)	
11	If incorrect, provide error correction (e.g., “No, that’s not quite right! The boy is happy because his favorite player just hit a homerun. Say happy!”)	
12	Repeat these procedures until all 20 animated videos have been shown	

Notes:

No Prompt Phase Treatment Integrity

Date:	**Participant #:**	**Trial Number:**
Observer:		

Step #:	**Task:**	**Check if Occurred:**
1	Randomize order of the 20 animated videos	
2	Prior to beginning the trial, state "This time, I am not going to give you the right answer, so when I ask you how the boy or girl feels, I just want you to try your best!"	
2	Show each video one at a time based on the randomized order	
3	At the end of each video, point to main character or place where main character exited scene	
4	Ask "How does he/she feel?"	
5	Record the participant's answer	
6	Record whether the answer was correct or incorrect	
7	Record whether the answer was prompted or independent (should be independent)	
8	If correct, provide verbal praise (e.g., "Yes, good job! The boy is happy because his favorite player hit a homerun!")	
9	If incorrect, do not provide error correction	
10	Repeat these procedures until all 20 animated videos have been shown	

Notes:

APPENDIX G

PHASE PROTOCOLS

Baseline Protocol

Prior to beginning each trial:

1. Ensure that each data collector has both a data collection sheet and treatment integrity sheet.
2. Ensure that each data collector also has both a list of all acceptable answers and this protocol.
3. Randomize the 20 animated video codes using an online list randomizer (random.org). Each video should be used exactly once per trial.
4. Fill in the data collection sheet with the pre-determined video order, as well as with all other needed identifying information.
5. Have each animated video pulled up on the iPad to ensure quick delivery.

During each trial:

1. Show each video according to the pre-determined randomized order.
2. After each video ends, point to the main character and ask, "How does he/she feel?". If the main character exited the scene before the video ended, point to the place where the character exited.
3. Record the participant's answer on the data collection sheet for each sub-trial. If the participant does not respond with an answer within 10 seconds, write "NA" or "No Answer" in the participant answer box for that sub-trial.
4. Record whether the participant's answer was correct or incorrect for each sub-trial. If the participant did not answer, mark this as incorrect.
5. Record whether the participant's answer was prompted or independent. For the baseline phase, all answers should be independent.
6. Do not provide the participant with any feedback, whether correct or incorrect.
7. Repeat these procedures until all 20 animated videos have been shown.

0-Second Prompt Delay Phase Protocol

Prior to beginning each trial:

1. Ensure that each data collector has both a data collection sheet and treatment integrity sheet.
2. Ensure that each data collector also has both a list of all acceptable answers and this protocol.
3. Randomize the 20 animated video codes using an online list randomizer (random.org). Each video should be used exactly once per trial.
4. Fill in the data collection sheet with the pre-determined video order, as well as with all other needed information.
5. Have each animated video pulled up on the iPad to ensure quick delivery.

During each trial:

1. Show each video according to the pre-determined randomized order.
2. After each video ends, point to the main character and ask, "How does he/she feel?". If the main character exited the scene before the video ended, point to the place where the character exited.
3. Immediately following the question (0 second delay), provide the participant with an echoic prompt (e.g., "Say happy").
4. Record the participant's answer on the data collection sheet for each sub-trial. If the participant does not respond with an answer within 10 seconds, write "NA" or "No Answer" in the participant answer box for that sub-trial.
5. Record whether the participant's answer was correct or incorrect for each sub-trial. If the participant did not answer, mark this as incorrect.
6. Record whether the participant's answer was prompted or independent. For the 0-second prompt delay phase, all answers should be prompted.
7. If correct, provide the participant with verbal praise (e.g., "Yes, good job! The boy is happy because his favorite player hit a homerun!").
8. If incorrect, provide the participant with error correction (e.g., "No, that's not quite right! The boy is happy because his favorite player just hit a homerun. Say happy!").
9. Repeat these procedures until all 20 animated videos have been shown.

3-Second Prompt Delay Phase Protocol

Prior to beginning each trial:

1. Ensure that each data collector has both a data collection sheet and treatment integrity sheet.
2. Ensure that each data collector also has both a list of all acceptable answers and this protocol.
3. Randomize the 20 animated video codes using an online list randomizer (random.org). Each video should be used exactly once per trial.
4. Fill in the data collection sheet with the pre-determined video order, as well as with all other needed information.
5. Have each animated video pulled up on the iPad to ensure quick delivery.

During each trial:

1. Show each video according to the pre-determined randomized order.
2. After each video ends, point to the main character and ask, "How does he/she feel?". If the main character exited the scene before the video ended, point to the place where the character exited.
3. Immediately following the question, give the participant 3 seconds to provide an answer.
4. If the participant does not respond within 3 seconds, then immediately provide the participant with an echoic prompt (e.g., "Say happy").
5. Record the participant's answer on the data collection sheet for each sub-trial. If the participant does not respond with an answer within 10 seconds, write "NA" or "No Answer" in the participant answer box for that sub-trial.
6. Record whether the participant's answer was correct or incorrect for each sub-trial. If the participant did not answer, mark this as incorrect.
7. Record whether the participant's answer was prompted or independent.
8. If correct, provide the participant with verbal praise (e.g., "Yes, good job! The boy is happy because his favorite player hit a homerun!").
9. If incorrect, say "no" and provide the participant with error correction (e.g., "No, that's not quite right! The boy is happy because his favorite player just hit a homerun. Say happy!").
10. Repeat these procedures until all 20 animated videos have been shown.

No Prompt Phase Protocol

Prior to beginning each trial:

1. Ensure that each data collector has both a data collection sheet and treatment integrity sheet.
2. Ensure that each data collector also has both a list of all acceptable answers and this protocol.
3. Randomize the 20 animated video codes using an online list randomizer (random.org). Each video should be used exactly once per trial.
4. Fill in the data collection sheet with the pre-determined video order, as well as with all other needed information.
5. Have each animated video pulled up on the iPad to ensure quick delivery.

During each trial:

1. Show each video according to the pre-determined randomized order.
2. After each video ends, point to the main character and ask, "How does he/she feel?". If the main character exited the scene before the video ended, point to the place where the character exited.
3. Record the participant's answer on the data collection sheet for each sub-trial. If the participant does not respond with an answer within 10 seconds, write "NA" or "No Answer" in the participant answer box for that sub-trial.
4. Record whether the participant's answer was correct or incorrect for each sub-trial. If the participant did not answer, mark this as incorrect.
5. Record whether the participant's answer was prompted or independent. For the no prompt phase, all answers should be independent.
6. If correct, provide the participant with verbal praise (e.g., "Yes, good job! The boy is happy because his favorite player hit a homerun!").
7. If incorrect, do not provide the participant with error correction, and move on to the next sub-trial.
8. Repeat these procedures until all 20 animated videos have been shown.

APPENDIX H

VIDEO CODES

H1: The boy sees his friends.
H2: The girl's favorite food is for dinner.
H3: The boy's favorite baseball player hits a homerun.
H4: The girl's mom bought her a puppy.
H5: School has finished for the day.

S1: The girl's dog died.
S2: The boy's friends won't let him play with them.
S3: The girl's balloon burst.
S4: It rains on the boy's picnic.
S5: It's the girl's birthday, but she is sick.

M1: The boy's dog leaves muddy footprints on the clean floor.
M2: The girl's brother ate all of her cookies.
M3: The kids run over the boy's sandcastle.
M4: A boy pushes the girl out of the way.
M5: Someone went in the boy's room and messed up his things.

A1: The girl sees a big spider.
A2: The boy is watching a movie about monsters.
A3: The girl sees a big mean dog.
A4: The boy is caught in a thunderstorm and sees lightning.
A5: The girl sees a big snake.

APPENDIX I

IRB APPROVAL

MISSISSIPPI STATE UNIVERSITY

Office of Research Compliance

Institutional Review Board for the Protection of
Human Subjects in Research
P.O. Box 6223
53 Morgan Avenue
Mississippi State, MS 39762
P. 662.325.3294

www.orc.msstate.edu

NOTICE OF APPROVAL FOR HUMAN RESEARCH

DATE:
November 13, 2019

TO:
Counseling Ed Psyc & Foundations

Daniel Gadke, PhD,

Cheryl Justice, PhD, Counseling Ed Psyc & Foundations, Haley Grant, BS, Dean of Education, Hal Bronson, BS, Counsel Ed Psych & Foundation, Jasmine Sorrell, BS, Counsel Ed Psych & Foundation, Johnna Dowdy, MS, Counsel Ed Psych & Foundation, Jordan Creviston, BS, Dean of Education, Katherine Johnson, BS, Dean of Education, Kasee Stratton-Gadke, PhD, Counseling Ed Psyc & Foundations, Lyndsay Fairchild, MA, Counsel Ed Psych & Foundation, Laurie O'Daniel, BS, Counsel Ed Psych & Foundation, Megan Anderson, MS, Counsel Ed Psych & Foundation, Mary Hurley, BS, Dean of Education, Meredith Huff, BS, Dean of Education, Melanie Elsenbroek, BS, Dean of Education, Margaret Powell, MS, Counsel Ed Psych & Foundation, Tawny McCleon, PhD, Counseling Ed Psyc & Foundations

FROM:
Dean/Assoc Prof, MSU Expedited

Kari Reeves, Assoc

PROTOCOL TITLE:
Situation-Based Emotions

Using Animated Videos and Prompt Delay Procedures to Train Children with Autism to Label

FUNDING SOURCE:
NONE

PROTOCOL NUMBER:
IRB-18-500

APPROVAL PERIOD:
Approval Date: November 13, 2019

The Institutional Review Board (IRB) for the protection of human subjects has reviewed the protocol entitled: Using Animated Videos and Prompt Delay Procedures to Train Children with Autism to Label Situation-Based Emotions. The project has been approved for the procedures and subjects described in the protocol. This protocol must be reviewed for renewal on a yearly basis for as long as the research remains active. Should the protocol not be renewed before expiration, all activities must cease until the protocol has been re-reviewed.

If approval did not accompany a proposal when it was submitted to a sponsor, it is the PI's responsibility to provide the sponsor with the approval notice.

This approval is issued under Mississippi State University's Federal Wide Assurance 00000203 with the Office for Human Research Protections (OHRP). If you have any questions regarding your obligations under Committee's Assurance, please do not hesitate to contact us.

Please direct any questions about the IRB's actions on this project to:

Kari Reeves

Approval Period:
through November 15, 2019

November 13, 2019

Review Type:
EXPEDITED

IRB Number:
IORG0000467