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Behavior Analytic Perspectives on Teaching Complex Social Behavior to Children with Autism Spectrum Disorder

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Abstract

Social behavior ranges from simple responses (e.g., making eye contact when speaking to another, imitating the behavior of others, initiating conversations) to complex responses such as understanding and taking the perspective of others, empathizing with others, maintaining conversations, using and understanding figurative language, understanding when someone is lying or being deceitful, and also knowing when to lie. Children with autism spectrum disorder often demonstrate deficits in social behaviors, thus requiring intervention. Although there is a growing body of behavior analytic literature related to teaching the simple, early social skills, behavior analysts have only recently begun discussions related to the component skills involved in complex social behavior and conducting research on strategies for teaching these advanced social skills. In this chapter, behavior analytic perspectives on perspective taking, empathy, advanced conversation skills, figurative language, and lying and deceit are described. Recent research and clinical recommendations for teaching each of these complex social behaviors to children with autism spectrum disorder are also described.

Social behavior produces stimuli (e.g., facial expressions, body posture, tone of voice, eye gaze, gestures) that effect the behavior of others (Schlinger, 1995). Social behavior includes a broad range of responses such as eye contact, imitation, joint attention, perspective taking, sarcasm, and lying. Understanding how to teach social behavior is particularly important when working with children with autism spectrum disorder (ASD) because a diagnosis of ASD is associated with core deficits in social communication and social interactions (American Psychiatric Association, 2000). These deficits manifest in the ways children with ASD engage in and respond to vocal (e.g., tone of voice) and nonvocal social stimuli (e.g., facial expressions, body posture) and social–emotional reciprocity (e.g., joint attention, affect). These types of social behavior impairments appear to be unique to ASD (Baron-Cohen, Leslie, & Frith, 1985). In fact, when compared to children of typical development and children with other developmental disabilities, children with ASD have fewer interactions with their caregivers, make less eye contact, show less sensitivity and affection to other people, are less likely than other children to comfort another child, share objects of interest with their parents

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C. B. McNeil et al. (eds.), *Handbook of Parent-Child Interaction Therapy for Children on the Autism Spectrum*, https://doi.org/10.1007/978-3-030-03213-5_8

less often, and fail to reciprocate affective expressions as often (Gena, Couloura, & Kymissis, 2005; Weiss & Harris, 2001a, 2001b). A child's proficiency in these areas may be correlated with indices of social competence and acceptance by others (Lovaas, Koegel, Simmons, & Long, 1973).

A lack of effective social communication skills combined with atypical interests and/or behaviors often shown by children with ASD (American Psychiatric Association, 2000) increases the likelihood that children with ASD will be victims of bullying (e.g., Cappadocia, Weiss, & Pepler, 2012; Gray, 2004). A diagnosis of ASD is typically made by the time a child is 4 years old (Baio, 2014), and although deficits in social communication (e.g., eye contact, joint attention) are frequently targeted in school programming, deficits in more complex social behavior (e.g., perspective taking, empathy, advanced conversation skills) often continue into adulthood (e.g., Howlin & Yates, 1999; Jennes-Coussens, Magill-Evans, & Koning, 2006). One likely reason that social behavior deficits persist throughout development is that as individuals age, social demands change, and social situations increase in complexity (e.g., nuances of dating, peer pressure; Baker, 2005; Smith Myles, Trautman, & Schelvan, 2013). Interventions for social behavior of children with ASD must go beyond teaching basic social communication skills such as eye contact and imitation to more complex social behavior such as taking the perspective of others, empathy, advanced conversation skills, understanding and using figurative language, and identifying and telling lies.

8.1 Types of Complex Social Behavior

8.1.1 Perspective Taking

One complex social behavior that poses a particular challenge for children with ASD is perspective taking (Baron-Cohen et al., 1985; Bauminger & Kasari, 1999; Gómez-Becerra, Martín, Chávez-Brown, & Greer, 2007; Weiss & Harris, 2001a, 2001b). Perspective taking involves knowing that other people might have differing beliefs from one's own and that their differing beliefs will affect their behavior (Schlinger, 2009; Sigman and Capps, 1997). From a behavior analytic perspective, perspective taking involves observing the behavior of another person and then (a) predicting their subsequent behavior, or (b) responding to private thoughts and emotions that another individual might typically experience in similar situations (LeBlanc et al., 2003). Individuals who lack perspective taking might not exhibit other social behaviors such as sharing, turn taking, empathy, responding to social cues, understanding figurative language, or comprehending lies and deceit (LeBlanc et al., 2003; Reed, Hirst, & Hyman, 2012). Deficits in perspective taking might make children with ASD appear rude or insensitive and discourage others from interacting with them and developing intimate friendships (Peters & Thompson, 2015; Weiss & Harris, 2001a, 2001b). Some studies show that early language development and later perspective-taking abilities are positively correlated (e.g., Astington & Jenkins, 1999) indicating that language likely plays a large role in taking the perspective of another person.

8.1.1.1 Component Skills of Perspective Taking

Simply observing another person's behavior and labeling it is likely not sufficient for then predicting future behavior or responding to relevant private events. To really begin taking the perspective of another person, one must first realize that his or her own experiences with the environment (what one senses) may differ from that of another person (Spradlin & Brady, 2008). For instance, as I sit here writing this, the stimuli I see, smell, hear, taste, and feel likely differ from my colleague who is sitting across the room because I am looking at my laptop screen, smelling the grape scent of the bubble gum that is in my mouth, listening to music through my headphones, tasting the grape flavor of the bubble gum in my mouth, and feeling the cool breeze of the ceiling fan that is right above me. My colleague does not have direct access to any of these

stimuli. Recognizing that others might have access to different stimulation via their senses (e.g., visual) is considered a component skill of perspective taking (Flavell, 1977; Gould, Tarbox, O'Hora, Noone, & Bergstrom, 2011; Hahs, 2015). After a child understands that his or her experiences with the environment differ from others, either the child can learn to predict other people's behavior by making a logical connection between the behavior and reinforcing outcome or the child can think about how he or she felt and subsequently behaved in similar situations (Spradlin & Brady, 2008). For instance, if I hear a song that was playing on the first date I had with my boyfriend, I might smile and be in a good mood. I might even get up and begin dancing around the room. My colleague, who is also working diligently on his own project, might look at me and ask, "What in the world are you doing?" He does not have access to the music playing through my headphones, does not know the song reminds me of my first date with my boyfriend, and is not feeling the need to "dance it" out at that moment. If I share the song with him and tell him the background information, he might relate it to a similar experience of his own and instead of thinking I am a very strange person, he might think about how he feels when he hears a particular song and smile and dance along with me.

Perspective taking is often assessed via false-belief tasks. There are three different types of tasks commonly used to assess false belief: (a) *the unexpected transfer*, (b) *the false identity*, and (c) *the misidentified object* (Spradlin & Brady, 2008). The *unexpected transfer* task consists of a participant watching or listening to a vignette that describes Person A placing an object in Location A, and then leaving the room. While Person A is gone, Person B moves the item to Location B. The experimenter asks the participant where Person A will look for the item when Person A returns. To pass this test, the participant must indicate that Person A will look for the object where Person A left it, in Location A. The *false identity* test consists of showing the participant a container that typically holds Item A (e.g., an M&M's® box is likely to hold M&Ms®). The experimenter asks the participant what he or she thinks is in the box, the correct answer being the item typically found in the container, Item A. The experimenter then shows the participant that the container does not hold Item A, but instead contains Item B (e.g., pencils). The participant is then asked what Person B, who has not seen the unusual contents of the container, will think it contains. To pass the *false identity* test, the participant must say Person B will think the container holds Item A, its usual contents. The *misidentified objects* task tests identification of a false belief by showing the participant an object that appears to be a common item (e.g., a rock). Upon further investigation, the participant learns that the item is not, in fact, Item A (the rock), but instead is actually Item B (e.g., a sponge). The participant is then asked what Person B, who has not had the opportunity to investigate the item, will call the item. To pass this test, the participant must say Item A, the item the object appears to be. It is thought that false-belief tasks test for all component skills of perspective taking.

8.1.1.2 Teaching Component Skills of Perspective Taking

Researchers have evaluated strategies to teach children with ASD to identify what others see (Gould et al., 2011) and how to respond on false-belief tasks (Charlop-Christy & Daneshvar, 2003; LeBlanc et al., 2003).

Both Gould et al. (2011) and Hahs (2015) taught children with ASD who ranged in age from 3 to 13 years old to identify what characters in pictures could see. The pictures had embedded stimulus prompts (red lines) to teach the children to follow the eye gaze of characters in the pictures and multiple exemplars of the pictures were used. During teaching the participants were presented with a picture and the instruction, "What does he/she see?" The stimulus prompts (red lines) were faded in length using most-to-least prompting from 7.2 cm, 3.3 cm, 0.5 cm, and then no visual prompt. This strategy was used to help transfer stimulus control from the direction of the line to the natural cue of the direction of the character's eyes. Access to a preferred item was delivered contingent on correct labels of what the

character was seeing. Error correction was implemented only if the training procedures did not result in desirable skill acquisition and was only necessary for one participant. All children learned to identify what the characters could see and generalization to other pictures was observed to some extent, for most participants. However, limited generalization was observed to natural situations.

Both Charlop-Christy and Daneshvar (2003) and LeBlanc et al. (2003) successfully used video modeling with embedded stimulus cues to teach correct responding to false-belief tasks. In both studies, participants were three males with ASD, who ranged in age from 6 to 13 years old. In the LeBlanc et al. study, participants watched a video of an adult correctly completing false-belief tasks. The video highlighted critical visual cues, and the adult modeled and explained the appropriate strategy. For example, a video demonstrating an unexpected transfer task would show a puppet leaving footprints in the sand leading to a box marked "1" where he put a treasure. Then the puppet would move the treasure to a box marked "2," this time not leaving any footprints. The video would focus in on the footprints and the adult model would explain the strategy (e.g., "he looks in Box 1 because the footprints lead to Box 1"). After the correct answer was modeled, the experimenter paused the video and presented perspective-taking questions to the participant. Praise and preferred items were delivered contingent on correct answers. Contingent on incorrect answers, the video was replayed and prompts to pay attention were provided until a correct answer occurred. Generalization across variations of the same type of task (e.g., false identity) was demonstrated; however, generalization across tasks (i.e., false identity and unexpected location) was not. Charlop-Christy and Daneshvar used similar procedures except that the video was presented twice before the participants were presented with perspective-taking questions and the experimenters also asked a control and memory question. The control question assessed understanding of the situation (e.g., "Where is the cookie?") and the memory question assessed whether the participant remembered where the item was at the beginning (e.g., "Where was the cookie at the beginning?"). Both within and across task generalization was observed for two of the three participants, while generalization of the skill was not observed for the third participant. Following additional training with different props and more detailed scenarios, the third participant still did not correctly respond to two of the five generalization tasks.

8.1.1.3 Recommendations for Practice

Teach children with ASD to identify what others sense in the environment as an initial step in helping children realize that others experience private events (e.g., teaching to follow eye gaze). Then teach more complex skills such as responding to false-belief tasks. Teach perspective taking using a variety of situations in which perspective taking is necessary. One way to do this is by using video-based instruction. Video-based instruction is a way that you can teach with a variety of situations (e.g., vignettes) without having to create teacher-arranged situations in the classroom or other settings (Luiselli, Russo, Christian, & Wilczynski, 2008). Instead, video-based instruction uses prerecorded video examples to teach skills. This also allows for consistent presentation of instruction within and across learners (Luiselli et al., 2008). To ensure accurate responding to both false-belief and shared-belief tasks, we also recommend that you include some examples in which the shared belief is true (e.g., the rock-looking object really is a hard rock).

8.1.2 Empathy

According to Baron-Cohen et al. (1985), children who cannot take the perspective of another person will be unable to predict the behavior of others. Thus, some researchers (e.g., Baron-Cohen et al., 1985; Gena et al., 2005; Lawson & Walsh, 2007) argue that perspective taking is an essential component for the development of empathy. Empathy is commonly described as showing concern and interest in others. Children with ASD who show empathy when others are sad, happy, angry, or hurt increase the likelihood of ongoing and future

interactions with peers, family members, and others in their social community (Schrandt, Buffington Townsend, & Poulson, 2009).

Although the early development of empathy in children of typical development is well established, less is known about the development of empathy in children with ASD (McDonald & Messinger, 2012). Children with ASD have been described as expressing emotions, particularly excitement and frustration, in unusual ways that often involve whole body or arm movements rather than the facial expressions or vocalizations observed in children of typical development (Carr & Kologinsky, 1983). Deficits in empathetic behavior by children with ASD might result in a lack of reinforcement for parent affection and thus might discourage further interactions (Charlop & Walsh, 1986). This may in turn decrease children's opportunities for learning appropriate and meaningful social interactions. Empathy has been said to control much of human social interactions (Vaish, Carpenter, & Tomasello, 2009). Some researchers have stated that empathy may lead to prosocial behaviors such as sharing and helping and may be incompatible with antisocial behaviors such as aggression (e.g., Hoffman, 1982; Vaish et al., 2009).

Empathy has been a topic of research in developmental psychology for decades (e.g., Hoffman, 1975; Knafo, Zahn-Waxler, Van Hulle, Robinson, & Rhee, 2008; Sagi & Hoffman, 1976; Zahn-Waxler & Radke-Yarrow, 1990); however, behavior analysts have only recently begun to evaluate procedures effective for teaching empathetic behavior. Unlike developmental psychologists who examine empathy as a response that emerges as a function of development, behavior analysts are interested in identifying the component skills involved in empathic behavior.

8.1.2.1 Component Skills of Empathy

Perspective taking seems to be a critical skill for empathetic behavior. Labeling, responding appropriately to, and displaying affective behavior are also critical component skills for empathy. Affective behavior includes vocal and motor responses such as facial expressions, verbal statements, body postures, and gestures (Gena, Krantz, McClannahan, & Poulson, 1996; Schrandt et al., 2009). Affective behavior signals not only the availability of reinforcement if a particular behavior is emitted, but also the availability of punishment for other behavior. The ability to identify affective behavior and how it relates to the private events of another and to modify one's own affective behavior accordingly is fundamentally important for social interactions (Gena et al., 2005). For example, as I am writing this, my colleague is preparing a cooler with refreshing adult beverages. I look at him and say, "You are going to do fun things instead of working?" while also making an angry face and crossing my arms. He effectively identifies my affective behavior as jealousy and responds with appropriate affect by saying, "Yeah, I'm sorry. It's for just a short period of time and then I have work to do too." while he shrugs his shoulders.

Children with ASD demonstrate deficits related to identifying, responding to, and making affective responses (McGee, Feldman, & Chernin, 1991). This is not surprising given that children with ASD have been reported to develop a social smile at a later age, show a narrower range of facial expressions than children of typical development (Le Couteur et al., 1989), and show more frequent inappropriate facial expressions than children of typical development (Konstantareas & Homatidis, 1989). Difficulties understanding and making appropriate facial expressions seem to be particularly associated with a diagnosis of ASD (Lord, 1993). Furthermore, studies have suggested that children with ASD have difficulty matching gestures, vocalizations, and contexts with appropriate facial expressions related to specific emotions (e.g., Hobson, 1986).

8.1.2.2 Teaching Component Skills of Empathy

Gena et al. (1996) taught affective behavior in the form of eye gaze, vocal statements, and facial expressions to four adolescents with ASD who ranged in age from 4 to 11 years old using modeling, prompting, and reinforcement. The affective responses were taught in response to five response categories including talking about favorite things,

laughing about absurdities, showing sympathy, indicating dislike, and showing appreciation. The experimenter presented a scenario relevant to one of the five response categories and the participant was required to emit the appropriate affective response. Tokens were delivered contingent on appropriate affective responses and error correction was implemented for incorrect responses. During error correction, the experimenter modeled the appropriate affective response and provided a verbal prompt for the participant to match the model. For example, if the participant responded "that's sad" while smiling, the experimenter said, "Show me a serious face and say, 'that's sad,'" while modeling a serious facial expression. The authors programmed for generalization of affective responding by teaching to some scenarios and then testing responding to other, untrained scenarios. There was an increase in appropriate responding across participants and generalization occurred to untrained scenarios, therapists, and settings.

Argott, Townsend, Sturmey, and Poulson (2008) used a script fading procedure combined with multiple exemplar training to teach three adolescents with ASD to make an empathetic response to three categories of affective stimuli that consisted of specific motor responses and facial expressions (hurt, tired, happy/excited). Generalization of empathetic behavior was assessed across untrained stimuli and with novel instructors. All participants showed an increase in responding across all the categories upon implementation of the intervention. By the end of the study, all participants engaged in empathetic responding across untrained stimuli and instructors.

Schrandt et al. (2009) used in vivo vignettes with dolls and puppets to demonstrate various types of affect and then taught empathetic responding consisting of both a vocal and motor response via modeling, prompting, and rehearsal to four children with ASD who ranged in age from 4 to 8 years old. The affective behavior in this study included a vocal statement and a motor response to three categories of affective stimuli including sadness/pain, happiness/excitement, and frustration. For example, the experimenter used a doll to act out a vignette, having the doll say "I hurt my elbow" while touching its elbow. Manual and auditory prompts were provided by a prompter who sat behind the participant and were faded across sessions as the participant began engaging in correct responses. Tokens were delivered if the participant engaged in the correct vocal and motor response (e.g., saying, "Are you okay?" and patting the arm of the doll) and behavioral rehearsals were conducted if the participant either didn't respond or responded incorrectly (e.g., made an appropriate vocal statement but did not make a motor response). The authors programmed for generalization of affective responding by teaching to some scenarios and then testing responding to other, untrained scenarios. All four participants learned empathetic responding across all trained categories and responding generalized from trained to untrained categories for all participants. For two participants, empathetic responding generalized to people in a non-training setting.

Sivaraman (2017) used prompting and reinforcement to teach empathetic responding to three categories of affective stimuli to two children with ASD who were 5 years old. For each category, the experimenter presented a nonverbal, verbal, and affective stimulus. For example, in the frustration category, the experimenter would hold an object (or part of an object) in each hand (i.e., nonverbal stimulus that signaled availability of reinforcement for appropriate response), say, "It is so hard to fix" (i.e., verbal stimulus that signaled availability of reinforcement for appropriate response), and display a frowning expression (i.e., affective stimulus that signaled availability of reinforcement for appropriate response). Praise and access to preferred toys and activities was given, if the participant engaged in the correct empathetic response. There were no programmed consequences for incorrect responses. The author programmed for generalization of affective responding by teaching to some scenarios and then testing responding to other, untrained scenarios. Results of the study showed that the procedure was effective and that responding generalized to novel affective stimuli.

8.1.2.3 Recommendations for Practice

Teach a variety of vocal, motor, and affective responses to a variety of affective categories (e.g., happiness/excitement, pain/sadness, frustration). Video modeling is a procedure that has been successfully used to teach children with ASD a variety of social behaviors including social initiations (e.g., Nikopoulos & Kennan, 2007), helping (Reeve, Reeve, Townsend, & Poulson, 2007), sharing (Marzullo-Kerth, Reeve, Reeve, & Townsend, 2011), perspective taking (Charlop-Christy & Daneshvar, 2003; LeBlanc et al., 2003), and conversational skills (e.g., Charlop & Milstein, 1989). Video modeling involves an actor modeling a desired behavior with a subsequent opportunity for the viewer to imitate the desired behavior. Video modeling maximizes consistency of intervention and may also help remediate difficulties with stimulus overselectivity often displayed by children with ASD (Lovaas, Koegel, & Schreibman, 1979). For example, facial expressions, gestures, and actions can be made more salient in video by exaggerating the behaviors and even pausing or re-watching a particular scene.

8.1.3 Advanced Conversation Skills

During a typical conversational exchange, there is a speaker and one or more listeners (Skinner, 1957; for further elaboration see Chap. 7). The behavior of the listener(s) serves as a consequence for the speaker's behavior and should have some effect on the likelihood that the speaker continues to speak or ceases conversation. Listener behavior that should control speaker behavior includes several nonvocal cues such as affect, tone of voice, and gestures. Children with ASD are often less sensitive to these nonvocal social cues than typically developing individuals (Neuringer, 2002; Volkmar & Klin, 2000; Waltz & Follette, 2009); thus, they might continue to speak about their own special topics of interest with no regard to the social cues displayed by their conversation partner(s). In an ideal conversational exchange, the behavior of the speaker would be reinforced in a multiple-schedule arrangement in which the listener's interest in the topic controls reinforcement (Peters & Thompson, 2015). When the listener is interested, continued speaker behavior will be reinforced and when the listener is no longer interested, speaker behavior will not be reinforced. Most research on restricted and repetitive behavior of individuals with ASD has focused on lower order forms of stereotypy, such as repetitive motor movements and vocalizations (Boyd, McDonough, & Bodfish, 2012; Patterson, Smith, & Jelen, 2010; Reed et al., 2012). Very few studies have addressed higher order forms of restricted behavior, such as preoccupation with highly circumscribed interests, and perseverative commenting (Koegel & Frea, 1993; Marriage, Gordon, & Brand, 1995; Peters & Thompson, 2015). In addition to difficulties with speech about special interest areas, children with ASD might not ask questions, they might interrupt, and they might not provide reinforcing motor responses (e.g., nodding head in agreement).

8.1.3.1 Component Skills for Advanced Conversation Skills

To effectively engage in a conversational exchange, a speaker must label and respond appropriately to listener behavior. The types of listener behavior that should be noted include affect, body orientation, and physical activity. For instance, my colleague attempted to speak with me while I am writing, and I made a grimace, turned away from him, and continued typing. These activities should indicate that conversation is not available or welcome at the moment. A speaker must also reinforce listener behavior by asking questions, adding more detail, switching topics, or ending conversations based on listener behavior. For example, if I am speaking to my colleague about the complexity of perspective taking, I might ask questions to ensure that he follows what I am saying, add more details to my description of it if he is not able to answer my questions, switch from talking about perspective taking to talking about what's for dinner if he appears uninterested, or cease conversation altogether if he starts looking at his phone instead of at me.

8.1.3.2 Teaching Component Skills for Advanced Conversation Skills

Koegel and Frea (1993) used in vivo modeling and self-management procedures to teach two adolescents with ASD social communicative skills including facial expressions and affect, nonverbal mannerisms, decreasing perseveration of topic, intensity of voice volume, and eye gaze. The researchers first taught the children to differentiate appropriate from inappropriate instances of social behavior by modeling both appropriate and inappropriate behavior and teaching the children to label the behaviors as such. Self-management involved giving the participants a digital watch and a sheet of paper with numbered boxes. The participants were instructed to place a mark on the sheet, beside the appropriate numbered box; each time the alarm sounded if the participant had made only appropriate social behavior during the interval. If participants were successful during the interval, they earned access to video games. Interval length was systematically increased from 1 min up to 9 min throughout the intervention. They also asked observers to rate the overall appropriateness of the children's social behavior pre- and post-intervention. The subjective ratings increased from "very inappropriate" at pre-intervention to "very normal" at post-intervention.

Davis, Boon, Cihak, and Fore (2012) used Power Card scripts (a task analysis regarding how to initiate and maintain conversations with peers) and Power Cards (brief written rules and pictures) to increase others-focused conversation (greet them by name, make eye contact, ask about conversation partner's interests, listen to the response, comment on their statement) with three adolescent males diagnosed with ASD. During pre-training, the instructor modeled and provided a rationale for each step/skill involved in others-focused conversations. Participants wrote the steps down on a worksheet and skills were assessed with peers in a small-group setting. Prompts, in the form of questions (e.g., "What did I forget to do?"), were provided if the participant made incorrect or incomplete responses. Once these skills were mastered, the Power Card procedure was implemented. The participant reviewed the Power Card script and card prior to engaging with a conversational partner. Results showed that others-focused conversation increased for all participants and that responding generalized to a novel peer for two of the participants.

Peters and Thompson (2015) used behavioral skill training to teach conversation skills to three children diagnosed with ASD. Behavioral skill training involves providing instructions, modeling a desired behavior, rehearsal of the desired behavior, and corrective feedback. In the first experiment, the authors targeted labeling listener behavior as interested or uninterested. Teaching this skill alone did not result in a significant increase in appropriate conversation behavior; thus, participants were taught to ask questions of the listener. This did result in an increase in conversational exchange. In the second experiment, the authors targeted labeling listener interest, asking questions of an uninterested listener, and changing the topic if the listener remained uninterested. In the third study, the authors targeted how to further vary their response if the question or change in topic did not result in listener interest. The results from all three experiments demonstrate that behavioral skill training was effective for teaching children with ASD to identify listener interest and disinterest and change their behavior accordingly.

8.1.3.3 Recommendations for Practice

A strategy for promoting variability in the behavior of individuals with ASD is to (a) teach new responses not currently in their repertoire (e.g., create a list of potential conversation topics), (b) reinforce the new appropriate responses and stop reinforcing the old inappropriate responses, and (c) prompt varied responding (e.g., say, "Try talking about one of your other topics."; Wolf, Slocum, & Kunnavatana, 2014). Video modeling (Bellini & Akullian, 2007) is a procedure that can be used to accomplish (a) and (b). During video modeling, an actor (child or adult) can model the occurrence and nonoccurrence of a target behavior that helps the participant learn the difference between appropriate and inappropriate responses (Leaf et al., 2012). When you make the videos for

video modeling you can make natural cues (e.g., gestures, facial expressions) more salient than live performances. In addition, videos can be paused and replayed, and specific images can be enlarged. Incorporating video feedback into teaching also allows you to prompt varied responding (c). Video feedback involves participants observing themselves and the naturally occurring listener cues in the context in which the behavior should occur (Deitchman, Reeve, Reeve, & Progar, 2010; Kern-Dunlap et al., 1992).

In addition to video modeling, consider incorporating a strategy for teaching children to monitor their own behavior. Self-monitoring has been used to teach a variety of complex social behaviors (Chung et al., 2007; Deitchman et al., 2010; Koegel & Frea, 1993; Maione & Mirenda, 2006; Thiemann & Goldstein, 2001) and has also been used to increase response variability (Newman, Reinecke, & Meinberg, 2000; State & Kern, 2012) of individuals with ASD.

8.1.4 Figurative Language

Much of our language has meaning beyond the words uttered said and sentences stated. Figurative language comes in many forms including metaphors, irony, metonymy, rhetorical questions, understatements, hyperbole, and indirect requests. Children with ASD have difficulties with each of those (MacKay & Shaw, 2004). Metaphorical reasoning involves the application of unconventional concepts to objects or events. For example, a child might say "I feel like I have butterflies in my stomach" before giving a presentation in front of class. The child with ASD might respond "There's no way you have butterflies in your stomach!" if the child with ASD takes the statement literally. To comprehend what is meant by a statement such as this, the child with ASD must attend to contextual cues and use those cues to reason what is meant by the statement. Compared to children with intellectual disabilities, Down's syndrome, ADHD, and individuals with brain injury, children with ASD perform more poorly on tasks involving metaphorical reasoning (Baron-Cohen, Leslie, & Frith, 1985; Happé, 1994).

Sarcasm is a form of verbal irony that generally involves statements such as praise that are really meant as insults; in other words, there is a discrepancy between what is said and what is meant (Capelli, Nakagawa, & Madden, 1990). When the speaker speaks sarcastically, the speaker intends to communicate a message that contradicts its literal meaning (Skinner, 1957). If the listener is to respond appropriately, the listener must reason that there is a difference between the literal meaning and the intended meaning. Sarcasm and irony are often used to indirectly convey attitudes and beliefs or to induce humor (Harris & Pexman, 2003; Pexman et al., 2011). Understanding sarcasm requires identifying the social cues necessary to differentiate between the speaker's intended meaning and the literal meaning of the utterance (Persicke, Tarbox, Ranick, & St. Clair, 2013). A perspective-taking repertoire is required to infer the speaker's intended meaning. Although children of typical development learn to respond to sarcasm around 5 or 6 years old and this behavior continues to develop throughout adolescence (Harris & Pexman, 2003; Pexman et al., 2011), children with ASD tend to be distinctively deficient in the perspective-taking abilities necessary for the comprehension of sarcasm and irony (Filippova & Astington, 2008; Happé, 1994; Pexman et al., 2011). These deficits may have a significant impact on social functioning because children might not understand common social interactions. For example, if a child with ASD drops his lunch tray on the floor and food goes everywhere, a peer might sarcastically say, "Good job carrying your lunch." The child with ASD might respond as though the peer is being literal (e.g., "No, it wasn't a good job. I dropped my tray."). This type of misunderstanding might result in the child with ASD becoming the subject of ridicule and even possible victimization (Van Roekel, Scholte, & Didden, 2010).

Another type of nonliteral language that many individuals with ASD have difficulty with is indirect requests (Paul & Cohen, 1985). Indirect requests can be conceptualized behaviorally as

disguised mands (Skinner, 1957). A mand is a response ("Can I have a piece of pizza?") controlled by an establishing operation (e.g., deprivation from pizza) and a discriminative stimulus (e.g., presence of a person holding a pizza box). Disguised mands ("Wow, that pizza smells good!") are responses that are under the control of an establishing operation (e.g., deprivation from pizza) and a discriminative stimulus (e.g., the presence of a listener) but in this instance the response does not specify the reinforcing consequence (e.g., access to pizza). Disguised mands often develop because mands specifying the consequence are punished by the social community (e.g., directly asking for food might be considered rude); thus, the person learns to make varied responses and these new varied responses (disguised mands) are reinforced. Not all listeners reinforce disguised mands. For example, a listener eating pizza might respond to the statement "Wow, that pizza smells good!" by simply saying, "Yes, it's very good." If the listener does not reinforce the speaker's disguised mand, the speaker may be less likely to mand in the presence of this listener in the future. The speaker may also be less likely to engage in other social interactions with a listener who does not reinforce disguised mands; thus, responding appropriately as a listener to disguised mands is a social skill that is critical to everyday social functioning.

8.1.4.1 Component Skills of Understanding and Using Figurative Language

There are a few common skills required to identify and respond appropriately to figurative language. For instance, perspective taking is a component skill required so that the listener adopts the speaker's viewpoint. Rule-governed behavior plays an important role in developing an understanding for relations between nonliteral speech and its intended meaning. Specifically, rule-governed behavior can be acquired by contacting rules that describe contingencies and not necessarily due to contacting the specific contingencies described (Skinner, 1969). My colleague is likely to respond effectively to the rule, "If you touch my food in the fridge, I will hurt you", without experiencing said pain.

Each type of figurative language may require different critical component skills. Specific to metaphorical language, an important skill is differentiating between same and different and identifying symbolic similarities between the nonliteral statement and the actual meaning of the metaphorical phrase. Identifying opposites (e.g., messy and clean) is a component skill for sarcasm where the speaker communicates a contradictory meaning of a statement and the listener must interpret the literal meaning. Additionally, identifying social cues such as facial expressions, preferences, prosody, tone of voice, and emotions is necessary to respond to sarcasm appropriately and also to convey sarcasm (Persicke et al., 2013).

To recognize disguised mands the listener needs to label private events based on observable speaker behavior (Najdowski, Bergstrom, Tarbox, & St. Clair, 2017). For example, while my colleague is drinking his adult beverage, I might say, "That looks yummy" while drooling, making big eyes, and holding my drinking glass tightly. He might then make me an adult beverage or offer me a taste of his after identifying my disguised mand through the vocal and nonvocal cues.

8.1.4.2 Teaching Component Skills for Understanding and Using Figurative Language

In the behavior analytic literature, only a few studies have attempted to teach figurative language to children with ASD. Persicke, Tarbox, Ranick, and St. Clair (2012) used multiple-exemplar training to teach metaphorical speech to three children with ASD ranging from 5 to 6 years old. Stories consisting of simple descriptions of characters and events were read out loud followed by corresponding metaphorical questions. For example, one sentence in the story read, "The cake had fluffy frosting, and smelled really good, but the cake was really hard on the inside." A corresponding metaphorical question was "If I say the cake was a rock, what do I mean?"

During multiple-exemplar training, the experimenter used leading questions to help the participant identify relations between the target items and its features. Modifications were made for two of the participants due to variable responding. A visual aid was provided consisting of two columns so that they could write features of the people and events of the story that matched with the metaphors. Novel exemplars were presented in each session to evaluate the generality of skills. Results demonstrated that one participant responded correctly to the metaphorical questions through the initial multiple-exemplar training and the remaining two participants acquired the skill with the addition of the visual aid. Further, all participants correctly identified the meaning of metaphors for novel stories.

Persicke et al. (2013) used rules, role-play, and feedback, across multiple exemplars, to teach three adolescents with ASD to identify and respond appropriately to sarcastic comments. In the first training phase, the participant was presented with a rule (i.e., "When someone says the opposite of what they mean, they are probably being sarcastic") and shown brief video models consisting of salient cues, followed by the experimenter stating a sarcastic or sincere comment. The experimenter helped the participant to answer a series of questions identifying relevant components of the video and comment. Similar questions were asked across sessions so that the participant could develop a problem-solving strategy to determine the meaning of the sarcastic comments.

Once participants demonstrated accurate identification between sarcastic and sincere comments, in vivo training was implemented across multiple exemplars. The session began with the experimenter stating the rule and asking the participant to repeat the rule. Procedures were similar to the first training phase; however, sarcastic and sincere comments were presented during natural conversation. Generalization was also programmed for by including novel exemplars, conducting sessions in different settings and implemented by different people. Further follow-up sessions were conducted up to 3 months of the completion of training for two of the participants. Procedures were effective for teaching all participants to identify and respond appropriately to both trained and untrained sarcastic comments. Behavior maintained during follow-up sessions.

Najdowski et al. (2017) extended previous studies using rules, role-play, and feedback as part of a multiple-exemplar training package to teach three adolescent boys with ASD to correctly respond to disguised mands. Training began with stating the rule, "Sometimes when a person wants something, they give hints about what they want instead of just asking for it," providing the rationale of why it is important to determine when someone is indirectly asking you for something, and role-playing. During training, if the participant did not correctly respond to a disguised mand, the experimenter asked a series of questions to prompt the correct response. A rotation of 20 disguised mand exemplars were targeted across different instructors and settings. The presentation of the rule was faded out to reach independent mastery of the target skill. Results demonstrated that the treatment package was effective in developing a generalized repertoire of disguised mands for all participants.

8.1.4.3 Recommendations for Practice

An abundant amount of behavior analytic research has shown the effectiveness of multiple-exemplar training for establishing complex social behaviors in individuals with ASD (Gena et al., 1996; Gould et al., 2011; Najdowski et al., 2017; Persicke et al., 2012, 2013; Reeve et al., 2007). Presenting multiple exemplars of stimuli has shown to promote generalization of the target skill and reduce the likelihood of rote memorization. When choosing exemplars it is recommended that you use stimuli to which the learner has no previous exposure; this is typically done to control for learning history or previous associations with stimuli. Further, exemplars can be presented through video or in vivo models. Videos can be prepared in advance to be more readily accessible, can be individualized for the child, and provide the ability to review clips if needed. On the other hand, in vivo models are more representative of scenarios the child may be exposed to in the natural environment. Whichever modality you choose to

use to teach the skill, initially the model should make relevant features salient by emphasizing words and exaggerating facial expressions. Be sure to fade exaggerated cues to match what is more commonly observed in everyday social interactions.

8.1.5 Lying and Deceit

Lying is a normal part of everyday interactions between individuals. Generally speaking, lying is a type of nonliteral language where the actual meaning of a phrase or story is different from the literal meaning of what is said (Ranick, Persicke, Tarbox, & Kornack, 2013). Lying occurs for many reasons (e.g., to avoid hurting other's feelings, to take advantage of others, or to embellish past experiences).

Although lying is typically considered to be problem behavior, there are social situations in which lying or deceit may be appropriate (Bergstrom, Najdowski, Alvarado, & Tarbox, 2016). For example, individuals may lie to avoid hurting other's feelings (e.g., complimenting a co-worker's dress, when in fact you may not like it), for keeping secrets (e.g., withholding a surprise birthday party date or promising a friend you will keep his or her "crush" a secret), or while playing games (e.g., lying about your hand while playing poker).

There is a dearth of research on how to teach deception skills to individual with ASD. This may be due to the fact that lying continues to be perceived as problematic and therefore is not targeted during skill acquisition for individuals with ASD. Deficits in other social behavior such as perspective taking are also likely barriers to teaching children with ASD how to identify and tell socially appropriate lies (Bergstrom et al., 2016).

8.1.5.1 Component Skills of Lying and Deceit

Bergstrom et al. (2016) suggest several component skills that may be necessary to have in one's repertoire to successfully engage in socially appropriate lying and deceit. Let's say, for example, your friend models a new lipstick color and asks your opinion on what you think is a highly unattractive shade of pink. First, you must (a) assess the appearance of the individual, then (b) envision the emotional effect on your friend if you state the truth, and (c) envision the consequences for your friend if you tell the truth verses lying. The types of responses associated with telling a lie depend on the environmental context and often require perspective taking (Baron-Cohen, 1993).

8.1.5.2 Teaching Component Skills of Lying and Deceit

Researchers have evaluated procedures to teach children with ASD to detect and respond to deceptive statements and to tell socially appropriate lies. Ranick et al. (2013) evaluated the use of behavioral skill training (rules, modeling, role-play, immediate feedback) on the identification of and responses to deceptive statements by three children with autism who ranged in age from 6 to 9 years old. The session began with a rule, "People lie when they don't want another person to know the truth. They say something that isn't true to make another person think what they are saying is true and to cover up the real truth." The child and therapist engaged in play activities during each session and the therapist presented deceptive comments in the context of conversation. If the child labeled the statement as a lie, the therapist provided verbal praise. If the child did not accurately label the lie, the therapist asked a leading question (e.g., "Wait a minute, was I telling the truth just now?"). If the child was still unable to identify the statement as a lie, the therapist restated the lie and asked the child if the statement seemed to be true or a lie and to explain why he chose truth or lie. If this did not work, the therapist told the child the correct answer and gave an explanation as to why that was the correct response. Teaching was conducted with multiple exemplars of deceptive statements. Each session included two novel deceptive statements (lies) and at least two previously trained deceptive comments. Probe sessions were conducted with peers or siblings to assess generalization of lie detection.

Generalization was also assessed with novel exemplars of deceptive statements. Results showed that the procedure was effective for all three participants. Each child learned to identify and respond to deceptive statements and responding generalized to novel, untrained lies and to same-age peers not involved in training.

Bergstrom et al. (2016) evaluated the use of rules, role-play, and feedback for teaching young children with ASD to tell socially appropriate lies. Participants were taught to tell lies when they were given an undesired gift and when another person's appearance changed in an undesired way during gift sessions and appearance sessions. During gift sessions, participants were presented with a wrapped gift containing either a non-preferred or an already owned toy (as per parent report). During appearance sessions, an adult's appearance was altered in a way that the participant did not prefer (based on parent report). During teaching, the participants were presented with rules, role-playing opportunities, and corrective feedback. For example, during gift sessions the participants were told, "Sometimes you might get a gift you don't like or already have, and you won't like it. It was nice of the person to give you a gift, and you don't want to hurt their feelings, so even though you are not happy you should smile and say something nice like, 'Thanks! I like it!'" During appearance sessions the participants were told, "If someone is wearing something you don't like or changes how they look, you need to make sure not to hurt their feelings by saying something nice if they ask what you think. Something like, 'it looks good,' or 'that's cool.'" After stating the rule, the participant and therapist engaged in role-playing opportunities. Praise was delivered if the participant engaged in the lie and corrective feedback was delivered if the participant either did not respond at all or responded incorrectly (e.g., did not smile or sound sincere). Reponses were scored using a 1- to 3-point scale. To receive three points the participant was required to tell a lie expressing approval, with a sincere tone, while smiling. The results demonstrated that all participants effectively learned to tell socially appropriate lies. In addition, generalization to untrained people and stimuli was observed.

Reinecke et al. (1997) taught three adolescents with ASD to engage in lies while playing a game. During Condition 1 of treatment, participants were taught to "guess," which was defined as pointing to or touching one of the experimenter's closed fists. In Condition 2, the participants were taught deception, which was defined as engaging in five separate, defined responses per trial of hiding an object (i.e., object occlusion, hidden transfer, empty fist closed, hiding fist closed, not indicating). During treatment in Condition 1, the experimenter hid a ball under a table and asked the participant "which hand is it in?" The participant was then asked to guess. Reinforcement was provided for independent guessing made by the participant. Incorrect responses resulted in verbal and, if necessary, physical prompts. In Condition 2, the participant was asked to hide the object while the experimenter guessed. Reinforcement was delivered if the participant engaged in all five independent deceptive responses (i.e., object occlusion, hidden transfer, empty fist closed, hiding fist closed, not indicating). The results demonstrated that two out of the three participants acquired the deceptive skills, with effects observed in baseline (before the introduction of treatment). Although these results suggest that the change in behavior was likely a result of some confounding variable, such as exposure to carefully crafted sessions, and not the intervention itself, it still indicates that individuals with ASD are capable of learning deceptive behavior.

8.1.5.3 Recommendations for Practice

Because telling socially appropriate lies involves perspective taking, many of the recommendations to teach lying are similar to those of perspective taking (e.g., video-based instruction; Luiselli et al., 2008). During video-based instruction an actor can model the target behavior under conditions in which it would be socially appropriate to tell a lie (e.g., during a game, keeping a secret, or receiving a non-preferred gift).

In addition to video-based instruction, strategies for promoting lying and deceitful behavior of individuals with ASD include (a) teaching rules about when you might tell a lie, (b) using role-play and feedback, and (c) teaching with multiple examples of social situations. Behavioral skill training has been shown to be effective in teaching social behavior to individuals with ASD (Bergstrom et al., 2016). Specifically, behavioral skill training has been used to teach individuals with ASD to detect and respond to deceptive statements of others (Ranick et al., 2013) and to teach advanced conversation skills (Peters & Thompson, 2015). When using behavioral skill training to teach individuals with ASD, provide instructions on what to say when lying and also give instructions related to the social contexts in which these lies should occur, model the social situation, practice it together, and then provide feedback on what the individual did correctly or incorrectly.

8.2 General Recommendations for Teaching Complex Social Behavior

A therapeutic behavior change is demonstrated only when behavior occurs over time, across persons and settings, and when the effects of the change spread to a variety of related behaviors (Stokes & Baer, 1977). One of the fundamental deficits demonstrated by children with ASD is the lack of generalization from trained locations, stimuli, and situations, to novel locations, stimuli, situations, and related responses. Children with ASD should be taught the types of social skills noted in this chapter and strategies should be used to promote the generalization of these responses across time, persons, and settings, and also to promote varied topographies of responding. In this section, we provide some general recommendations regarding strategies that should be incorporated from the onset of social skill training to enhance generalization and maintenance of the newly learned skills.

8.2.1 Generalization

You can plan to maximize the potential for generalization by incorporating common stimuli into training, teaching with multiple exemplars, ensuring skills contact natural consequences, reinforcing generalized responding, and teaching strategies to mediate generalization (Stokes & Baer, 1977). Training that requires varied response forms helps to ensure the acquisition of varied responding and also increases the likelihood that untrained topographies will emerge (Cooper, Heron, & Heward, 2007).

It can be difficult to identify common stimuli, relevant exemplars, natural consequences, appropriate and inappropriate contexts for behavior, and appropriate topographies of responses. One way to identify these variables is by using a general case analysis (Cooper et al., 2007; Ducharme & Feldman, 1992). It is important to note that with the general case model, you plan for and program for generalization from the beginning of training rather than after some set criterion is met (O'Neill, 1990). Steps in the general case analysis include (a) defining the instructional universe (identifying where, with whom, and with which stimuli the behavior should occur); (b) defining the range of relevant stimulus and response variations within the instructional universe (determining variability desired in conditions under which the behavior occurs and variability in the types of responses made, including exceptions); (c) selecting examples for teaching and testing (ensuring that examples represent the variability noted in b); (d) sequencing teaching examples (using multiple exemplars, teaching to opposing examples, reviewing previously taught exemplars, teaching exceptions last); (e) teaching the examples (use techniques demonstrated effective in the literature); and (f) testing for generalization with novel examples (Horner & Albin, 1988; Horner, McDonnell, & Bellamy, 1986; Horner, Sprague, & Wilcox, 1982; O'Neill, 1990). General case analysis has been used as part of the process to plan for and program for generalized repertoires of prosocial behavior (Marzullo-Kerth et al., 2011; Reeve et al., 2007) and lan-

guage skills (Garcia-Albea, Reeve, Brothers, & Reeve, 2014). It has not yet been applied to the types of complex social behaviors noted here, but considering the intricacy of social contexts and interactions it seems that general case analysis would prove useful for identifying nuanced variables critical for inclusion in effective training programs.

8.2.2 Maintenance

In addition to generalization across environments and behaviors, think about how you can create lasting changes in behavior; otherwise, the intervention is not truly effective (Baer, Wolf, & Risley, 1968). Self-management strategies might prove useful for enhancing generalization and maintenance (Ninness, Fuerst, Rutherford, & Glenn, 1991) of social skills. If behavior change does not maintain, ask yourself if the new behavior is being supported in the environment outside of your intervention (Kennedy, 2002). If support is not present, it is necessary to determine if the target behavior is of importance to the individual and others in the environment. Kennedy (2002) suggested that maintenance of skills might be used as an index of social validity. When skills are used regularly (due to multiple opportunities in daily life), they are more likely to be maintained than skills that are used rarely.

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