



Behavior Analytic Interventions for Developing Social Skills in Individuals with Autism

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THE CHALLENGES OF LEARNING AND TEACHING SOCIAL SKILLS

Social skills intervention for children with autism is an area in which gains have been modest and the development of innovative clinical approaches has been limited (Rao, Beidel, & Murray, 2008). Social skills are among the most elusive targets to teach. One impediment to teaching social skills is that there may be limited intrinsic interest on the part of individuals with autism spectrum disorders (ASDs) to learn these skills. Many individuals with ASDs lack social interest and fail to comprehend social nuances. In addition, they often exhibit little social initiation, as well as reduced social responsiveness.

It is often difficult to identify the best methods for teaching social skills. Most social skills are multielement skills that require an individual to engage in multiple behaviors and distinct tasks. Also, most social skills involve an element of judgment in determining whether and when to use each skill (e.g., Is it appropriate to engage in this behavior at this time?). Such complexities make it difficult to teach such skills effectively and thoroughly. How can practitioners operationally define social judgment? How can practitioners best prepare learners for the endless possibilities that exist in the natural social environment?

This chapter examines the components of social skills necessary for effective social functioning. In addition, commonly used approaches for teaching social skills are reviewed. The importance of identifying the critical elements of intervention is discussed.

BASIC COMPONENTS OF SOCIAL SKILLS

Social initiations include skills such as greeting others, asking questions of others, commenting to others, and asking to join ongoing activities. Social responses include responding to the social overtures of others, which may include greetings, questions, and offers to join activities. In individuals with ASDs, social initiations are generally weaker than social responses. Applied behavior analysis (ABA) has been shown to be extremely effective in building social initiations and social responses.

Social skill impairments include impairments in making social initiations, responding to social overtures, and demonstrating social comprehension (i.e., behaving appropriately in circumstances that require complex or multicomponent initiations and responses). Impairments in these central skills limit the success of social integration and can negatively affect how an individual interacts with others in his or her environment.

One of the common questions posed regarding social skills training is when such training should actually commence. Often, clinicians conceptualize social skills as being complex or later-stage curricular targets. However, many of the initial emphases and core foundation skills are essentially social in nature. Consider three main early foci of educational programs: play skills, imitation, and manding/requesting training. Each skill is social in nature and focuses on attention to and interaction with another person.

Play skills have long been a focus of early intervention and instruction. Aberrant play skills distinguish children with autism from peers who are typically developing and make it difficult to promote parallel and cooperative play skills. Furthermore, training children with autism in the functional and intended uses of objects facilitates a wide variety of functional and play skills. Children with well-established play repertoires are also more likely to engage in productive activities (and less likely to engage in purposeless or stereotypic behaviors) when less supervision is available. For children, socialization is play and play is socialization. Play is emphasized in curricular programming because it serves as a very effective bridge to social contact with peers.

Imitation has also been a strong historical emphasis in programming for children with autism (Leaf & McEachin, 1999; Lovaas, 1981; Sundberg & Partington, 1998; Taylor & McDonough, 1996). A deficit in imitation is an early and clear sign of autism. Although children who are typically developing are constantly watching and doing, such behavior is exceedingly rare in children with autism (Ingersoll & Schreibman, 2006). Teaching imitation is important for building a wide variety of skills in all areas, and teaching attention to a model facilitates the development of more complex imitation skills and the use of peers as a source of information in social and school settings. Several curricula have emphasized the importance

of assessing imitation skills and systematic instruction in imitation as a foundation skill (Leaf & McEachin, 1999; Sundberg & Partington, 1998; Taylor & McDonough, 1996).

In general, clinicians have approached imitation training through discrete trial instruction. However, there is evidence that naturalistic approaches to teaching imitation skills enhance generalization and increase other social-communicative behaviors (Ingersoll & Schreibman, 2006). Perhaps a combination of formal and informal instruction is best. Formal instruction provides multiple learning opportunities that are simply not available in naturalistic instruction. In addition, formal instruction can systematically build aspects of imitation that are central to developing a strong imitative response class. Examples of such elements of imitation include delayed imitation, sequenced imitation, and complex imitation. Naturalistic instruction ensures that imitation training is integrated into natural interactions, and all naturally occurring learning opportunities are captured. The social and generalization benefits should increase the extent to which naturalistic imitative training is integrated into interventions.

Manding/requesting has become an increasingly prominent focus of instruction because the field has recognized the importance of methods to build initiation skills. Historically, discrete trial instruction built social responsivity, not social initiation. Sundberg and Partington (1998, 1999) integrated Skinner's classification of verbal behavior into teaching language to children with autism. In this context, they highlighted the importance of mand training to increase initiation.

These emphases and developments have strengthened the quality and the scope of social skills programming at young ages and have created a good foundation for working on social responsivity and social initiation in other ways (Leaf & McEachin, 1999; Maurice, Green, & Luce, 1996; Sundberg & Partington, 1998).

QUALITATIVE ASPECTS OF SOCIAL BEHAVIORS

Qualitative aspects of social initiations and responses affect the functional utility of social skills learned, regardless of how they are taught. Social initiations and responses emitted may lack clarity (e.g., a child who waits near the water table as a mand to join) or be blatantly inappropriate (e.g., a child who initiates a game of chase by pulling another child's hair). Such children may lack independence and require facilitation from an adult. Such assistance may be subtle (e.g., encouragement) or intrusive (e.g., scripting).

When skills lack clarity or are inappropriate, they typically do not result in social interaction. In fact, ineffective social initiations and inappropriate social behaviors often reduce the extent to which an individual is approached, leading to increased isolation (Mesibov, Adams, & Klinger, 1997).

Another qualitative aspect of social skills is the latency to respond. For a social response to be functional, it must occur within an acceptable time frame. If there is a delay of 5 or 10 seconds after a child is greeted and before he or she responds, many social opportunities are lost. Peers will often leave the social interaction when they do not receive a timely response. They may also infer that their friend is not interested in or able to respond to them, reducing the likelihood of future initiations with them. These attributions or explanations of a child's failure to respond further reduce the likelihood of future attempts to interact. Ensuring a quick latency to respond is a very important aspect of skill mastery that is often overlooked.

Another time-based aspect of social responding is the duration of interactions. Although many individuals with autism successfully master simple conversation or play exchanges, they falter when the interaction continues. An exchange of one or two back-and-forth communications may be successful, but individuals with autism may be unable to continue the interaction beyond these simple and preliminary exchanges. It is important to target the duration of conversational and play skills to increase the success of learners with autism in social exchanges.

SOCIAL COMPREHENSION

Social comprehension describes the complicated social responses and initiations that are part of navigating the social world. Individuals are required to understand social rules, engage in behaviors that are expected in given contexts, and interpret social nuances. Social comprehension skills are essential in making meaningful progress in effectively navigating the social world. (In essence, what is often referred to as social comprehension is simply more complex forms of social responding. From an ABA perspective, such comprehension is conceptualized as sequenced or complex social responses.)

Some commercially available curricula target the development of such skills and have clearly defined lessons for teaching a variety of behaviors (Baker, 2003a, 2003b; McGinnis & Goldstein, 1990; Richardson, 1996; Taylor & Jasper, 2001). Many of these curricula are written from a behavior analytic point of view, outline precise and well-defined teaching strategies, and require the collection of data to guide decisions.

Whether or not such commercially available curricula are used, social comprehension interventions are generally layered approaches involving a variety of instructional strategies. Often, several approaches are used together, in a combination or packaged approach, to address such issues. Such packages may include both empirically validated and nonempirically validated techniques. Strategies commonly used in such packages include video modeling, Social Stories, rule cards, and role playing.

Video Modeling

Video modeling is an effective means of teaching a wide variety of skills, including the imitation of peers (Haring, Kennedy, Adams, & Pitts-Conway, 1987), learning sign language (Watkins, Sprafkin, & Krolikowski, 1993), developing play skills (Charlop-Christy, Le, & Freeman, 2000), and building conversation skills (Charlop & Milstein, 1989; Sherer et al., 2001). The research base in this area has led to clinical extensions of video modeling to teach academic skills, community-relevant skills, conversational exchanges, and play skills (Snell & Brown, 2000; Taylor, 2001; Weiss & Harris, 2001).

Many students with ASDs are strong visual learners, enjoy watching videos, and attend well to a model presented in a video clip. Clinically, video modeling is often done with an adult demonstrating the skill first. From a practical perspective, an adult model controls the instructional variables and ensures that the salient aspects of the target behavior are highlighted. Alternately, older peer tutors or mature peers can be used as models. These choices have obvious advantages because of the similarities of peers to the target students.

In video modeling, learners observe a video clip of the desired actions and are prompted to engage in the behaviors depicted on the video. Initially, there may be simultaneous imitation of what is being watched (doing the actions along with the model on the video), followed by delayed imitation of what was observed (watching the clip and then engaging in the behaviors). Rote response can be a significant concern because many learners will precisely imitate the sequence from memory, so it is essential to program variability into the video modeling protocol. Such variability in programming ensures that the response class of imitation is strengthened.

Another extension of video instruction is to use videos to provide feedback to learners on their performance during play activities. Reinforcement and corrective feedback can be provided. In addition, areas of weakness can be targeted for additional training (Taylor, 2001).

Guidelines for using videos with learners exist (Krantz, MacDuff, Wadstrom, & McClannahan, 1991). Suggestions include ensuring the presence of prerequisite skills, removing extraneous stimuli from the enactment, and considering cognitive level as a possible factor influencing the appropriateness of the intervention.

Social Stories

Social Stories can be used to both increase and decrease behavior. For example, Social Stories can be used to explain the actions required to buy food at a grocery store, order meals in a restaurant, or explain the contingencies required to access a desired reinforcer (e.g., time on the computer

is earned through worksheet completion). Social Stories are often used to convey behavioral expectations for multielement situations (which change frequently), for fear situations, and to reduce challenging behaviors.

Learners with autism often have difficulty understanding expectations in social situations. Social Stories have become increasingly popular as an instructional strategy for learners with ASDs (Barry & Burlew, 2004; Delano & Snell, 2006; Sansosti, Powell-Smith, & Kincaid, 2004). Social Stories are brief descriptions of expectations that are explained in the context of a story created for an individual to describe a specific scenario the learner will encounter (Gray, 1993, 1994, 2008). Typically, the story is written from the perspective of the learner, in a meaningful format for people with ASDs (Gray, 2000). Social Stories are often supplemented with pictorial cues or photos in addition to textual information (Reynhout & Carter, 2006).

Gray (2000) outlined suggestions for developing effective Social Stories and included guidelines about the types of sentences to be used. There are seven recognized sentence types for creating Social Stories (Barry & Burlew, 2004; Crozier & Tincani, 2007; Reynhout & Carter, 2006):

1. *Descriptive* sentences provide factual information.
2. *Perspective* sentences provide insight regarding the thoughts, the feelings, and the behaviors of others.
3. *Affirmative* sentences are used to reassure learners.
4. *Directive* sentences tell learners what specific behaviors are expected.
5. *Control* sentences use analogies to explain situations.
6. *Cooperative* sentences give learners information about who can help them in different situations.
7. *Consequence* sentences give learners information about what will happen as a result of actions.

Although using Social Stories is common in clinical practice, the number of carefully controlled investigations is relatively small. Most clinical guidelines for using Social Stories have not been empirically validated and require more comprehensive investigation.

Barry and Burlew (2004) used a multiple-baseline design across two participants to evaluate the effects of Social Stories on independent choice making and appropriate play. The authors reported that the level of prompting required for choice making decreased for both participants, and the duration of appropriate play increased. However, the study did not control for other ongoing interventions in the classroom at the time of the intervention, thus significantly limiting the power of the findings.

Thiemann and Goldstein (2001) used Social Stories with text cards, visual cues, and video feedback to increase the social behaviors of five learners

with autism. The targeted social behaviors included contingent responses, securing attention, commenting, and requesting. The effects of Social Stories were evaluated using a multiple-baseline-across-skills design. Small group instruction was done with two typically developing peers and the children with autism. The results indicated that Social Stories effectively increased the targeted social behavior of the learners with autism. In addition, two learners demonstrated generalization to other social skills. This was encouraging, even though these effects may have been caused by the similarity of the targeted skills. Although the data on acquisition were encouraging, there was a general lack of maintenance across skills and learners.

Social Stories are often used in combination with other interventions as part of a packaged social skills intervention (Reynhout & Carter, 2006). When Social Stories have been examined as part of packaged interventions, some gains have been noted (Sansosti & Powell-Smith, 2008; Swaggart et al., 1995). However, the existence of multiple, simultaneous interventions in these studies limits the extent to which the effects of intervention can be attributed to any one variable, including Social Stories.

When studies employ more than one intervention method (Barry & Burlew, 2004; Burke, Kuhn, & Peterson, 2004; Thiemann & Goldstein, 2001), the degree to which Social Stories are responsible for an effect is unclear. Delano and Snell (2006) extended the research of Thiemann and Goldstein (2001) by using the same social skills but isolating Social Stories as the only intervention. During intervention, social skills increased for all three learners. However, as the Social Stories were faded out, the effects disappeared. Two learners showed generalization of social skills to their general education classroom. The effects were higher than baseline but were not maintained at levels achieved during intervention.

The tendency for Social Stories to be implemented concurrently with other interventions is a serious challenge to understanding their potential efficacy. Another major challenge in the use of Social Stories is the lack of available data on the essential elements of their use. Clinical implementation and the development of the Social Stories are highly variable, presentation to a student is highly idiosyncratic, and staff training procedures are largely ignored. There have been no controlled studies examining the length of each intervention phase.

The literature describes a variety of formats designed for implementing Social Stories. They include having a teacher or a parent read to a child (Crozier & Tincani, 2007), having a child read the story (Thiemann & Goldstein, 2001), listening or watching a story on a computer or a television (More, 2008; Sansosti & Powell-Smith, 2008), and listening to a story embedded in a song (Brownell, 2002). Crozier and Tincani (2007) outlined specific strategies for ensuring appropriate instruction, including getting the learner's attention.

The widespread use of Social Stories is not in line with the limited data available regarding their efficacy. Despite the paucity of data, they remain a very popular tool for intervention. Parents and teachers generally report liking Social Stories (Burke, Kuhn, & Peterson, 2004; Dodd, Hupp, Jewell, & Krohn, 2008) and do implement them. Are there potential benefits to this likelihood of implementation? Perhaps Social Stories enhance parent and teacher attention to targeted behaviors, which may result in more prompting and reinforcement of the targeted skills. Social Stories may also result in the use of more direct behavior change procedures by teachers and caregivers.

There also appears to be a discrepancy between the perceived effects of intervention and the future use of Social Stories. Dodd, Hupp, Jewell, and Krohn (2008) reported that the parents in their study were not certain whether the Social Stories had improved the target behaviors, but they planned to continue using them and extending their use.

Crozier and Tincani (2007) reported that teachers liked using Social Stories and found their outcomes to be favorable, although the teachers did not always continue to use them. When the results are promising, it is difficult to identify the critical components of such effectiveness. Developing more effective methods for evaluating Social Stories will lead to improvements in creating and implementing them. It is possible that their effectiveness may be a result of other elements of the packaged interventions, and this should be systematically studied.

Rule Cards

Another strategy for increasing social skills is a rule card or a similar approach known as the Power Card strategy (Gagnon, 2001). The Power Card is a small card that a learner carries that summarizes a strategy to use when a particular problematic circumstance occurs. The card is generally individualized for a learner with a picture of a preference or a strong interest. The behavior or skill is encouraged through its connection to the special interest (Keeling, Smith Myles, Gagnon, & Simpson, 2003).

Keeling et al. (2003) used the Power Card strategy to decrease the whines and the screams of a 10-year-old student with autism in game playing. A multiple-baseline design was implemented across three game activities. On the first day of the intervention, a full Power Card script was read, in which the student's favorite cartoon character modeled appropriate responses for both winning and losing games. Prior to all other intervention sessions, a shorter version of the Power Card was read, which listed three strategies for winning and three strategies for losing (all of which came from the longer script). The Power Card was effective in decreasing the whines and the screams, and the intervention generalized to the third ac-

tivity, which had never been targeted with the Power Card. The student used the strategies described on the card in new settings with peers and even modeled the responses for a classmate. A limitation of the study was that data were presented only for problem behavior.

A closely related intervention is the script-fading procedure, in which textual prompts can be embedded into a picture activity schedule or a conversational exchange (Krantz & McClannahan, 1993, 1998). Scripts can increase the number of social initiations made by learners with autism, the length of the social interactions, and the number of unscripted interactions. Behaviors developed with scripts have been shown to be maintained and generalize to new activities. Stevenson, Krantz, and McClannahan (2000) used an audiotaped script to increase the social interactions of four students, ages 10–15. Every participant was able to produce high levels of unscripted responses, and the results were maintained after the scripts were faded.

Summary of Strategies to Build Social Comprehension

Social skills are difficult to define and challenging to teach. Furthermore, it is often difficult to evaluate the impact of the instructional methods used. Social skills are often targeted in a wide variety of ways, and they may be addressed through a package of instructional strategies. Some of the commonly used approaches include Social Stories, rule cards, and video modeling. Although probably the most widely used approach, Social Stories have little data supporting their effectiveness. Even though there have been some reports of success, it is not clear whether using Social Stories is the critical element responsible for the effects. In fact, it is likely that other procedures used in combination with Social Stories were responsible for those effects. Conducting component analyses would help to isolate the unique contribution of Social Stories. In addition, research is needed on the critical elements of Social Stories as an intervention approach. Video modeling and social scripting have good empirical support. It is essential that variability be included in scripts and models to ensure generalized and functional results. The use of rule cards is an interesting clinical direction, particularly when used in combination with role playing or other behavioral rehearsal techniques.

Often, these strategies are used as part of a package of interventions designed to address a specific deficit or issue. For example, Social Stories or rule cards may be used in combination with other procedures in a package of behavioral teaching interventions. Such package interventions may assist the clinician in teaching these multielement skills. In addition, they may provide more practice and learning opportunities and increase the degree to which training prepares learners for the range of possible experiences in the social world. As is the case with all interventions, direct

behavior change procedures should always be used to effect behavior. In addition, data on the effectiveness of all strategies used with individual learners should be collected and used to determine which elements of an intervention should be used with a learner in the future.

OTHER TARGETS

Other approaches to social skills training may have utility for learners with ASDs. Some of these approaches have been demonstrated as effective with other populations of learners, whereas others are theoretically compelling. In particular, a great deal of attention has been paid to interventions designed to increase perspective taking, problem solving, and joint attention.

Perspective Taking

Perspective taking refers to the capacity to understand the thoughts and the feelings (or perspectives) of others (Baron-Cohen, 1989; Baron-Cohen, Leslie, & Frith, 1985). In typical development, perspective taking emerges during the preschool years, but children with autism often have significant impairments in their ability to understand the perspectives of others. This skill is of particular importance because of its relationship to other critical social skills, such as turn-taking, empathy, sharing, conversational exchange, and social initiations (LeBlanc et al., 2003).

Theory of mind is a theoretical construct encompassing many skills and mental capacities. A person is said to have a theory of mind when he or she can infer and understand others' desires, beliefs, and feelings (Ozonoff & Miller, 1995). Research on theory of mind often uses measures of appearance reality, false belief, and representational change to operationally define perspective taking and theory of mind (Charlop-Christy & Daneshvar, 2003; Taylor & Carlson, 1997). Such tests measure an individual's ability to distinguish between what something may appear to be and what it truly is. Similarly, tests may assess a person's ability to accurately label what people believe about a situation, particularly when they have different or incomplete information.

Literature on the teaching of perspective taking is limited. Two studies have used video modeling to teach perspective taking (Charlop-Christy & Daneshvar, 2003; LeBlanc et al., 2003). In these studies, children with autism ranging in age from 6 to 13 years old were taught to answer questions by watching videos of others answering the questions correctly. Charlop-Christy and Daneshvar (2003) used three false-belief tasks, referred to in the literature as the Sally-Ann task, the M&M's task, and the hide-and-seek task. As an example, in the Sally-Ann task, Ann

moves a ball belonging to Sally from a basket to a box. The child is asked where Sally will look for the ball when she reenters the room. Children with autism will usually not demonstrate awareness that Sally's knowledge base is different from Ann's and will not factor in the difference in their observation of the object's movement. In other words, people with autism assume that Sally will answer based on the reality of the object's location, not on the basis of her experience.

In the Charlop-Christy and Daneshvar study, training was provided on each task until the children were able to demonstrate generalization of the skill on a similar example. All three participants were able to learn the tasks and correctly answer questions on similar tasks. Only two participants were able to pass the posttest (an untrained Sally-Ann task) at the conclusion of the training. LeBlanc et al. (2003) used a similar method with the addition of reinforcers delivered for correct answers. The results were similar to those of Charlop-Christy and Daneshvar. Two out of three of their participants passed the untrained Sally-Ann task at the end. These studies lend support to using video modeling and suggest that multiple exemplar training may be a useful component of social skills training packages.

Two interesting clinical questions arise: Who might best be helped by tasks involving perspective taking? Which learner characteristics predict acquisition and generalization? Anecdotally, Charlop-Christy and Daneshvar (2003) reported that the participant who did not pass the posttest also had the most difficulty answering questions about what he or she had seen in the video and was the least social and verbal of the three participants. The nonpassing participant in the LeBlanc et al. (2003) study was the oldest participant at 13 years old (the other participants were both 7 years old), perhaps pointing to limits imposed by age (or a combination of age and ability). There is, in fact, some evidence of a correlation between performance on perspective taking and age-equivalent scores on the Daily Living scale of the Vineland Adaptive Behavior Scales (Rehfeldt, Dillen, Ziomek, & Kowalchuk, 2007).

Perspective taking is theoretically compelling because the interventions are designed to address what is perhaps the central social deficit of autism. There is great potential clinical utility in this area. However, more research is needed to understand how to best teach such skills and, most important, how to teach them in ways that transfer to natural social situations.

Problem Solving

The navigation of conflict situations is often very difficult for individuals with ASDs. Difficulties in managing such situations can lead to serious negative social consequences. The term *problem solving* refers to the ability

to use available information to develop strategies to solve problems (Agran, Blanford, Wehmeyer, & Hughes, 2002). Learners with autism often exhibit a lack of problem-solving abilities, including difficulty in selecting the appropriate strategy for a situation, generating alternative solutions, and knowing when to change strategies (Gagnon, 2001). When solutions are generated, they may not be socially appropriate (Channon, Charman, Heap, Crawford, & Rios, 2001).

Practitioners agree that problem-solving skills are essential to success in school and community settings. However, there is a paucity of information about what to teach and how to teach it. Teachers are often simply not providing the necessary learning opportunities or experiences that would help students to improve in this area (Agran et al., 2002).

Goddard, Howlin, Dritschel, and Patel (2007) found that individuals with Asperger syndrome were less likely than their neurotypical counterparts to develop detailed and effective solutions to social problems. These researchers suggested that one component of successful problem solving may be autobiographical memory. They found that those with Asperger syndrome demonstrated significantly longer latencies to recall memories and had a fewer number of memories recalled overall compared with neurotypical peers. It is possible that such characteristics are somewhat related to deficient problem solving because individuals may be less able to draw from memories of past experiences.

Problem solving is indeed important in school and is central to navigating the social world. Many students with other types of difficulties (e.g., attention-deficit/hyperactivity disorder) have benefited substantially from problem-solving approaches. Problem-solving training usually involves helping learners identify problems and select appropriate solutions. Children with ASDs often have difficulties with deciphering the ambiguity of social problems and evaluating options for a course of action. They may fail to see the range of options or respond impulsively. Problem-solving training (Shure, 2001a, 2001b, 2004) can help students identify problems, generate alternative solutions, evaluate the effectiveness of different potential courses of action, and choose the best option. This can be done as a whole-class intervention or as an individual intervention.

The social autopsy is a variation of problem solving commonly used with students with high-functioning autism or Asperger syndrome (Bieber, 1994). This approach helps to identify cause-and-effect relationships between one's behavior and the reactions of others. This clinical approach involves reviewing the situation in detail after the event and creating a plan to prevent further instances (Dunn, 2006). The specificity of the application to real-world difficulties encountered by the individual may increase the effectiveness of this approach.

Joint Attention

Children are often initially referred for an autism evaluation when they exhibit language delays. However, social delays are also often observed at an early age. One such deficit is a lack of joint attention. Joint attention typically develops before a child speaks his or her first words. The topic of joint attention has received much attention in the literature because it may have important implications for early diagnosis and intervention (Bruinsma, Koegel, & Koegel, 2004; Dawson et al., 2004). The concept of joint attention consists of a variety of behaviors (e.g., gaze following, social referencing, protoimperative gestures, protodeclarative gestures, monitoring). Joint attention is frequently described as a coordinated shift in attention between an object or an event and another person that occurs in a social context. The term is used to refer to both recruiting (or initiating) attention and responding to the bids of others. For instance, a child recruiting attention may point to a toy while saying "Look." Other examples related to joint attention include a child responding to bids for attention from others, turning to look when the child hears his or her name called, or looking both at a toy being offered and at the person holding it. In addition to the many operational definitions used in the literature, joint attention is also often used colloquially to mean sharing attention or understanding what another person is interested in. Children with autism typically exhibit significant impairments in joint attention.

Whalen and Shreibman (2003) distinguished between two main types of recruiting attention: protoimperative and protodeclarative. Although both types of attention recruitment may be similar in topography, the function of each is different. Whalen and Shreibman described protoimperative gestures and vocalizations as those used to request access to an object, whereas protodeclarative gestures and vocalizations are used to recruit attention for sharing or mutual attending to an object. Mundy et al. (2007) described the concepts of protoimperative and protodeclarative gestures and vocalizations as initiating behavior regulation/requests and initiating joint attention, respectively. In addition, they described the response to joint attention and the response to behavior requests to characterize the responding to others' bids for joint attention.

Joint attention is considered an important skill partly because of its possible relationship to several domains of development. Joint attention has been linked to language development, socioemotional development (Sheinkopf, Mundy, Claussen & Willoughby, 2004), and frontal lobe function (Mundy & Crawson, 1997). Joint attention has been suggested as important in understanding language outcomes later in childhood. Morales et al. (2000) found that response to joint attention was directly related to vocabulary development in learners between 6 and 24 months. Bruinsma, Koegel, and Koegel (2004) reported that the time spent engaging in joint

attention behaviors was positively related to the size of a child's vocabulary in the future.

There is some evidence to suggest that joint attention can be taught. Kasari, Freeman, and Paparella (2006) assigned children to one of three experimental groups: a joint attention intervention group, a symbolic play intervention group, and a control group. The groups differed in their primary intervention goals, focusing on teaching either joint attention or symbolic play. Sessions were conducted daily for 30 minutes for 5–6 weeks. Improvements in joint attention and joint engagement were found for both treatment groups as compared with the control group, and they were generalized from the instructor to the child's caregiver. The authors recommended that early intervention programs should incorporate play and joint attention into their targets of intervention.

In a similar study by Kasari, Paparella, Freeman, and Jahromi (2008), the authors compared the effects of different interventions (joint attention intervention and symbolic play intervention) on expressive language development in 3- and 4-year-old learners with autism. They found that children in both the joint attention and the symbolic play intervention groups made gains in expressive language relative to the control group. In addition to the initial improvements, the effects grew stronger across time (12-month follow-up compared with the control group). This suggests that there may be significant benefits to including training on joint attention and symbolic play when designing interventions for young children with autism.

Joint attention interventions are compelling for reasons similar to those reviewed for teaching perspective taking. Yet much work remains to be done to identify how to teach such skills and how to generalize such skills to natural interactions and contexts. However, if researchers can target these core impairments with focused interventions, they may be able to significantly increase the magnitude of socially significant changes achieved.

SUMMARY

Compared with strides in addressing other impairments in individuals with ASDs, the results demonstrated in remediating social skill impairments are modest. Individuals with ASDs have very significant social impairments, including problems in responding to others and making social overtures. In addition, there are often problems in the quality of social initiations and responses made by individuals with autism. Initiations and responses may be unclear, inappropriate, prompted, or delayed. Poor-quality responses result in less social success.

In addition, many social skills are complex, multielement skills, requiring a variety of component skills. The demonstration of social skills also requires social judgment regarding when and how to use the skills.

It has been more difficult to operationally define social skills because of the subskills involved and the necessary skills in social judgment that are intrinsic to successful mastery.

Many techniques are commonly used for teaching social skills to individuals with ASDs. ABA approaches have been demonstrated to be highly effective in teaching discrete social responses and initiations. Numerous behavioral and nonbehavioral techniques are commonly used to build more complex social responses involving the understanding of social rules and the interpretation of nuances. Some of those techniques are not empirically validated or have been used primarily with other populations. Many of these techniques are used in packaged or combination approaches. It is important to identify the unique contributions that each strategy is making to skill acquisition to ensure efficient and effective instruction.

Newer directions for social skill intervention include addressing impairments in problem solving, perspective taking, and joint attention. More research is needed to identify the critical elements of these targeted interventions and strategies for enhancing the generalization of learned skills to real-life social exchanges in the natural environment.

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