



Improving the Social Behavior of Children with Autism

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Social behavior arises because one organism is important to another as part of the environment.

—B.F. Skinner (1953, p. 298)

Defining “Social Skills”

Think of the “most social” person you know. What does that person do to give you that impression? Perhaps she’s good at conversation, makes friends easily, or is gregarious at parties. Or perhaps he is a good listener, asks insightful questions, or can readily identify another’s distress and provide just the right support. Social behavior is complex, and involves the dynamic interaction of a variety of discriminative stimuli and consequences. We know it when we see it, and we can sense its absence—yet a concrete definition of a “social skill” remains elusive. And while experts agree that “social skills” can, and often must, be taught, there is little consensus on just what constitutes social behavior (Romanczyk, White, & Gillis, 2005).

Broadly, a social skill could be considered any response that impacts, in a positive way, interpersonal relations with another person. For example, if, knowing that a friend is ill, you ask how she is feeling, your comment may provide your friend with much-needed comfort, and thereby positively affect the interpersonal relationship you share. But other social skills may have little direct effect on interpersonal relationships. For example, while speaking quietly in the library is a learned social skill

that positively affects the wellbeing of others—patrons may then enjoy their books in peace and quiet—it has little to do with interacting in an interpersonal way with another person. At the same time, however, we all recognize such skills as part of a social and cultural fabric we share and observe.

One could likewise posit that a social skill is a response maintained by positive social—rather than tangible—reinforcers: a reciprocal compliment, for example, or an enjoyable interaction with a friend. Nevertheless, some social responses are also maintained by tangible reinforcers. Thus, a child may ask for a cookie by saying, “I want cookie,” but his parent may prefer a more socially acceptable request, such as, “May I have a cookie, please?” When a child consistently gets the cookie by using the latter request, he learns that the polite response (a social skill) is more likely to win him the desired cookie. The cookie, in turn, maintains the more socially appropriate response.

To further complicate any effort to define what is “social,” some undeniably social responses can be maintained by negative reinforcers. Imagine a college freshman who calls home two times a week to ward off a mid-week call from her mother, who will predictably complain about how infrequently her daughter phones home. Here, the young woman’s social initiation is partially maintained by the consequence of avoiding her mother’s nagging. Moreover, social skills involve not only readily apparent vocal verbal behavior (e.g., initiating a greeting with an old friend at a party after not seeing him for a long time), but also involve subtle—or not so subtle—nonvocal behaviors, such as standing at the appropriate distance from the person you are talking to, or knowing just how long to look into a person’s eyes when you are speaking or listening. And, further still, social skills not only involve *initiating* responses with others, but also the ability to *respond* to others’ initiations, and interpret the subtle and unwritten rules of social engagement and provide an appropriate social response. For example, recognizing that your companion is no longer interested in a chosen topic of conversation, or realizing that you have inadvertently insulted someone, are critical social skills, as are the responses that follow.

And while it may make intuitive sense to assume that communication and language skills must be “social skills,” that equation does not always hold true. There can be no doubt that communication and social skills overlap, and often significantly. The polite request for a cookie delivers a message, as does the telephone call to an ailing friend. Both responses are communicative and social, even though they lead to different reinforcers. At the same time, however, some language skills may have no direct social value at all. Rehearsing a list of grocery items while on your way to the store is not necessarily social: No one hears your recitation of the list, nor does another act or react on the basis of your utterances. Still, the noncommunicative recitation of the

list may play a role in some larger social initiative; perhaps you are shopping for a dinner party, or trying to remember items your ailing friend asked you to pick up at the store.

In addition, some social skills only communicate a message if the social skill is *not* demonstrated. As explained above, it is certainly a social skill to stand an appropriate distance from a conversation partner. That skill, however, has little palpable communicative content—until the norm is violated. Standing too close to another person may indicate aggression, attraction, or rudeness; standing too far away may suggest shyness, or intimidation, or disinterest. Selecting the appropriate conversational distance seems merely neutral. The same is true of lowering one’s voice in a library. Adherence to the social norm sends little or no message, while its violation speaks volumes—here, literally. In the end, the interaction of language, communication, and social skills in a given context may not be immediately apparent.

Of course, modern technology continues to shift and transform the boundaries of social behavior. Social skills now include the complex rules of negotiating web-regulated social worlds—to “friend,” or not to “friend”?—and the intricacies of differentiating between textual responses appropriate to one medium, yet patently improper to another. Consider the evolving language of text-messaging, in which configurations of standard punctuation marks—say, >:(or ;-p—communicate complex emotional messages by approximating facial expressions. Likewise, the social and communication skills that may generate an avid following on Twitter are worlds away from those of the political blogger. As technology continues to expand, social skills and social repertoires will expand and morph in response, often eluding concretized notions of appropriate social behavior.

Social Behavior and Children with Autism

Given the complexity of normative social behavior, it is hardly surprising that it is challenging to teach social skills to children with autism who have significant deficits in these areas. Indeed, although deficits and skill sets may vary widely on the spectrum, all children with autism have at least some challenges in social behavior. Some impairment in social function is, after all, a component of the autism diagnosis.

But even in children with autism, social deficits may manifest in many different ways, and with great subtlety (Klin, Jones, Schultz, Volkmar, & Cohen, 2002). It is not uncommon, for example, for a child with autism to initially avoid social interaction all together. For example, one youngster at the Alpine Learning Group abruptly left preferred play activities when a teacher

simply sat next to him in the play area. For other children, the deficits in social behavior may be more apparent in their lack of attention to important social cues such as not knowing when a social partner is no longer interested in a topic of conversation. A child with autism who has well-developed vocal verbal behavior skills, for example, may still select inappropriate conversational topics, or dwell on chosen subjects too long. So, too, a child with considerable social motivation may engage in repetitive behavior that is socially stigmatizing, and which limits the extent to which peers are willing to socially interact with him. And a single fundamental skill deficit may also lead to other social impairments: A child who experiences difficulty initiating or sustaining eye contact may struggle to share nonverbal experiences, or to interpret another person's facial expressions.

Thus, while autism by definition involves the impairment of social skills, that impairment presents with as much subtlety and complexity as appropriate social behavior may present in neurotypical persons.

Still, it is widely understood and well documented that children with autism can be taught certain social skills (for reviews see: Gillis & Butler, 2007; Matson, Matson, & Rivet, 2007; White, Koenig, & Scahill, 2007; Reichow & Volkmar, 2010). Using the tools of applied behavior analysis, learners with autism can be taught many of the foundational skills that are the building blocks of social behavior, and practitioners and parents alike may rely on research-based strategies to increase a child's motivation to engage in social activities more consistently and independently. To be sure, the subtleties of social behavior necessitate keen assessment and creative methodology. And, even then, certain social skills may prove elusive, notwithstanding the quality of our interventions. But the success can be palpable, and meaningful: as with social behavior itself, we know it when we see it.

Assessment and Goal Selection

Before one can start teaching social skills, it's essential to conduct an assessment of the child's social behavior. A number of variables inform assessment and goal selection. Skinner's analysis of verbal behavior (1957) and his conceptualization of the different verbal operants (mand, echoic, tact, intraverbal, and so on) is instructive in helping to identify both social skills to target and potential reinforcing contingencies. For example, when a child points to an item in the environment and says that item's name (e.g., "A plane!"), and is content with his mother's reaction and praise, then that verbal operant is a tact (i.e., a label) maintained by generalized social reinforcers. Thus, when teaching a child to initiate bids for joint attention, it may

be necessary to teach the child a sufficient tact repertoire before initiating instruction in the skill itself. Moreover, since tacts are thought to be maintained by generalized social reinforcers, efforts should be made to use these types of rewards for social responses that incorporate tacts, such as bids for joint attention, or comments. In fact, emerging research indicates that these responses can be successfully shaped with social contingencies alone (e.g., see Taylor and Hoch, 2008b).

Similarly, asking questions is an important social skill, but it is also a mand. It is hypothesized that mands are maintained by specific stimuli—in this case, the answer to the question—and occur only when there is sufficient motivation. As such, interventions to teach children to initiate questions incorporate ways to increase a child’s motivation to ask the question. Likewise, the instructor ensures that the answer provided is itself reinforcing. For example, when teaching a child to ask, “Where are you going,” an adult may abruptly leave a fun interaction (e.g., a pretend birthday party) that she is having with the child. The abrupt disruption increases the likelihood that the child will want to know where the adult is going. The teacher then prompts the child to ask the question, and provides an answer that leads to important information, such as “I’m going to get us some more ice cream!” In this case, the adult is increasing the likelihood that the child will want to know the answer to the question, while at the same time increasing the reinforcing nature of the answer.

Mands may also serve to gain access to tangible items. In this case, teachers can arrange the environment in such a way to increase mands toward others, thereby increasing the rate of initiations toward others. In one study we conducted, we taught children with autism to mand (request) tangible items from peers. Peers were taught to withhold the child’s preferred items until the child asked the peer for the items. Over time, the children with autism began to approach their peers more often to ask for the items—one step in the direction of social behavior.

On the other hand, more complex social skills (e.g., conversation) require the learner to discriminate among many different stimuli simultaneously. According to Skinner, intraverbals may place several distinct verbal responses under the control of a single word or group of words, and, in turn, different stimulus words may control the production of a single response. For example, the single comment “I’m going on vacation next week” may be discriminative for several unique responses, such as, “Where are you going?”; “I was on vacation last week”; “You’re going to miss Mary’s party!” and so on. Thus, complex verbal interactions require an individual to vary his or her responses in relation to many different, shifting variables—no small task for learners with autism. Faced with these instructional challenges, Skinner’s

analysis of verbal behavior may provide a framework for understanding the potential discriminative stimuli that may occasion responding, as well as the reinforcers that may maintain them. By considering these variables when selecting goals and designing interventions, we may increase the efficiency with which the responses are learned.

Considerations for Assessment

A thorough assessment will lead to identification of potential target goals as well as appropriate instructional methodology. There are a number of published social skills assessments and questionnaires that can assist practitioners in identifying gaps in social skills and targeting objectives. These include The Walker-McConnell Scale of Social Competence and School Adjustment – Elementary version, (1995); The Autism Social Skills Profile (ASSP), 2007; etc. In addition, various published curriculum may point parents and teachers in the direction of specific social skills to target (e.g., Taylor & Jasper, 2001; Weiss & Harris, 2001). In general, though, when a particular assessment tool is not used, social skills are assessed through direct observation, along with parent or teacher interviews, and with consideration of a number of variables:

Developmental Norms: Recognized developmental norms will provide a framework and continuing guide for any assessment. As is widely understood, certain behaviors routinely develop at certain ages. Not surprisingly, teaching interventions are far more effective when educational goals are correlated to appropriate developmental stages. Joint attention, for example, typically develops when a child is 9 to 12 months old. Accordingly, targeting joint attention for a toddler is developmentally appropriate. Alternatively, many theory of mind related responses do not seem to emerge until after age four or five years, so attempts to teach such skills to a toddler would be inappropriate.

Initiations and Responses to Initiations: Attention should be paid not only to a child's responses to the initiations of others (e.g., answering questions presented by a peer), but also to the child's own initiations to others (e.g., asking a peer questions). Because responding and initiating are two different response classes, it cannot be assumed that a child who is able to respond to another's social initiation will also initiate the same responses with others. A recent study on joint attention conducted at Alpine Learning Group illustrates this principle (Taylor & Hoch, 2008a). Although participants in the study learned to respond to bids for joint attention, they did not initiate joint attention bids as a result of learning to respond, indicating that initiation and responses often must be taught separately and specifically.

Nonvocal Behavior: The assessment should also include examination of both vocal verbal behavior (e.g., initiates greetings) and nonvocal behavior (e.g., makes eye contact with listeners). While vocal responses may be the most apparent to an observer, consideration must also be given to the nonvocal responses that emerge independently, those that accompany vocal utterances (e.g., gestures), and to more subtle nonvocal behavior (e.g., sustaining eye contact).

Environmental and Contextual Variables: Social behavior can be highly variable and may be context specific. For example, a child inclined to initiate play in the classroom may not do so on the playground, or a child capable of engaging in conversation with adults may struggle to do so with peers. As a result, assessment includes direct observation of responding in different environments, with different stimuli and with different people.

Social and Cultural Norms: The assessment must also take into account social behaviors or social norms that are more appropriate in certain contexts or cultures than others. For instance, social behavior at work or in a classroom is distinct from social behavior on the playground or in the lunchroom. Similarly, a child's cultural background and social environment may make particular responses more appropriate than others. Ethnic and religious groups often employ different greetings, for example, or have different expectations regarding physical contact. These considerations can be important in determining appropriate learning goals.

Behavioral Challenges: Lastly, the assessment should determine whether the child displays any challenging behavior that may impact or impede the development of social skills and social relationships. For example, if the child engages in high rates of repetitive behavior, such as making loud noises or talking to herself, interventions specifically targeting the problem behavior may be a prerequisite to effectively improving related social skills.

Consideration for Goal Selection

Once a thorough assessment is conducted with consideration of the above variables, teachers prioritize objectives to incorporate into the child's immediate treatment program. The assessment, however, is likely to yield many more programs than can possibly be implemented. For example, at Alpine, it was determined that a newly enrolled student, Billy, did not initiate a vast array of social responses. Among other things, he did not make eye contact when speaking, avoided interactions with peers, and could not answer basic social questions. His teachers were then faced with prioritizing objectives and identifying the most relevant skills to target in his current program—no easy task. Prioritizing objectives, however, can be aided by considering the following:

Age and General Skills: The first is the child's age, and his general skills in other areas. For example, if a child is sixteen months old but does not speak, and actively avoids initiating eye contact with others, it may be most relevant to target initiation of eye contact in order to gain access to a preferred activity, or to concentrate on social turn-taking games that of necessity involve eye contact (e.g., peek-a-boo). On the other hand, for a teenager who demonstrates good vocal verbal behavior and is participating in a community work program, making small talk with coworkers on breaks may be a more immediately pertinent goal. In the example of Billy, despite having a well developed manding (requesting) repertoire, he did not make eye contact when speaking. Since he had certain skills (requesting) but lacked other skills (eye contact), which impeded the social nature of the interaction, it was determined that targeting eye contact when speaking would be an appropriate goal.

Environment-Appropriate Goals: Second, consideration should be given to the social skills that are needed or required within the environments that make up the student's social and educational world. For example, if the child is attending a typical preschool environment, increasing both interest in peers and initiations toward peers may be a priority (Taylor & Jasper, 2001). By the same token, if a child is poised to begin attending a community recreation program, learning to wait his turn to engage in an activity may be an appropriate social goal. Although Billy was primarily going to be attending school at Alpine, the environment is one that values eye contact. Therefore, the skill would likely be required and reinforced within his immediate school environment and was relevant to target in his immediate program.

Family Priorities: Third, it is important to examine parent or care provider priorities: what is important for the family? For example, parents may be interested in having their child interact with siblings, participate in community or religious activities, report on their daily activities, or participate in a family dinner. Or a sibling may want the child to learn how to play a particular game. Not surprisingly, families are highly motivated to assist in teaching or generalizing skills when they are actively involved in selecting the targets that matter most to them. In the case of Billy, his parents were very interested in having him answer questions presented by community and family members. As a result, we prioritized teaching Billy to answer basic social questions such as where he attended school, his favorite subjects, and his preferred leisure activities. These responses were highly valued by his parents and were readily integrated into community and family interactions.

Ease of Acquisition and Range of Application: Fourth, when possible, goals are identified that: 1) may be learned with relative ease, and 2) will have the biggest impact across a wide variety of environments and peo-

ple. For example, responding to greetings will affect the learner's interactions at school, at home, in the community, and at work. Likewise, the skill will be used in interactions with peers, family members, coworkers, customers, and community members alike. In the same way, it may make sense to prioritize a simpler skill with broad application—say, answering social questions—before focusing on more challenging skills, such as interpreting facial expressions. For Billy, the social questions he was learning were highly valued by his parents and had a broad range of application (e.g., at parties, with relatives, in the community, etc.). But our decision to teach this skill was also informed by the fact that Billy was able to imitate vocal responses fairly well. This indicated to us that he would learn the skill of answering questions with relative ease.

Individual Interests: Sometimes specific skills actually lend themselves to a learner's existing interests. At Alpine Learning Group, for example, one student who was fond of video games never included others in his play activities. Rather than teach him to participate in group sports or board games, instructors first concentrated on teaching him to play video games with friends and peers, rather than alone. Likewise, if a student struggles to initiate and maintain conversation with others, we may first teach her to talk about her favorite topics, and address the appropriateness and variety of conversation topics later. In unusual cases, sophisticated learners with autism may even help identify their own learning targets. Whatever the case, individual interests may be useful both in selecting goals and implementing interventions.

Flexibility in Sequencing: In the best of all worlds, the development of social skills would follow along a continuum, beginning with early social responses such as eye contact and joint attention, then building incrementally to more complex behaviors, such as inferring another's intentions or attitudes and responding accordingly. Because children with autism present with such complex learning challenges and uneven skills across many areas, however, social skills instruction rarely follows a typical, linear sequence. For example, an assessment might identify that a fairly challenged teenager with autism has not yet developed many early social responses, such as joint attention or the ability to read facial expressions. Given his age and learning challenges, however, it may not be appropriate to target these early social skills, but rather to concentrate on responding to greetings and saying, "Excuse me" when someone is in his way. In other words, the selection of goals is informed by learner characteristics and the functionality of the social skill that is identified. While consideration of necessary prerequisite skills is essential, goal selection does not necessarily follow a strict sequence.

Teaching Social Skills

The Role of Motivation

The consequences used to shape behavior are a core component of any intervention targeting social skills. In the early development of neurotypical children, certain social responses appear to be shaped by social reinforcers alone. These social reinforcers are consequences delivered by another person or persons, and they may take several forms: facial expressions (e.g., smiles), vocalizations (e.g., “What a big boy!”), gestures (e.g., clapping), physical interactions (e.g., affection, tickles), or any combination thereof. Children with autism, and particularly those who happen to be significantly socially avoidant, often struggle to appreciate these types of social reinforcers. As a result, early in treatment, it is often difficult to shape the social behavior of children with autism using social engagement alone, and it is sometimes necessary to devote time to developing the reinforcing potential of social engagement and interaction. While applied research is much needed in this area, there are several clinical strategies that may increase a child’s interest in social interaction:

Pairing Social Engagement with Preferred Tangible Items or Activities: As a first step, social engagement may be paired with tangible reinforcers to encourage the student to appreciate the social consequences alongside the tangible reward. Over time, the tangible items may be gradually removed, until only the social stimuli remain. Take, as an example, a young preschooler who was extremely avoidant of both adults and other children, to the extent that she refused to open her eyes in the presence of others, and threw a tantrum when faced with almost any social interaction. Nevertheless, because her favorite activity was watching videos, Alpine Learning Group instructors began pairing teachers with access to preferred videos. Initially, the teacher simply sat in the room behind the child when the video played. Gradually, the teacher moved closer and closer to the student. Over time, access to the video was paired with physical contact (e.g., patting her back and stroking her hair) and positive comments.

In time, the teacher was able to interact with the child before turning on the video, and finally, without turning the video on at all. In the end, the child began to approach the teacher on her own and initiate the interactions (e.g., extending her arms to be picked up, asking for tickles, etc.). Teachers were then able to introduce social engagement and interaction as reinforcers in her other learning activities. Emerging research likewise supports the proposition that providing social interactions along with the child’s requested activity can lead to increases in social engagement (Koegel, Vernon & Koegel, 2009).

Providing Preferred Activities Noncontingently Alongside Social Engagement: Initially, to strengthen the adult presence as a reinforcer, teachers may provide a child's highly preferred items or activities noncontingently (freely, without requiring the child to work for them) along with social interaction, with the goal of conditioning the adult as a potential reinforcer. When adults become conditioned reinforcers, it may increase the likelihood that the child will approach and interact with the adult, both when the preferred item or activity is present, and afterwards, when it has been faded or removed. The peers in Alpine Learning Group's peer modeling program, for example, are taught to provide activities noncontingently to the child with autism, which, in turn, increases the learner's interest in the peers (Taylor & Jasper, 2001). One youngster, for instance, rarely approached peers and did not request activities from them even though he had learned to request items from adults. Alpine staff devised a program of having the peers provide preferred toys to the child on a fixed schedule (e.g., every five minutes). Over time, the child with autism began to approach his peers more consistently and started to request items that the peers held in view.

Using Social Interaction to Improve the Value of a Preferred Item or Activity: Another strategy is to have an adult use social interaction to improve the value of a preferred item or activity. Imagine a child who already enjoys spinning around on an office chair. If an adult can help the child spin faster and longer, thereby intensifying the experience, the child may begin to appreciate these interactions with adults and seek them out more regularly. One child, for example, liked to jump on the trampoline but whined and cried if someone tried to jump with her. Her teachers started by holding her hands and helping her to jump higher. Eventually, the child started to pull her teachers toward the trampoline. While the initiation may initially have been to have the teacher help her jump higher, attainment of the desired response (jumping higher) was dependent on social contact with another (holding her teacher by the hand and leading her to the trampoline).

Variables That Affect Motivation

The demonstration of a social skill will also be directly related to the degree to which the individual is "motivated" to engage in the response. Tom, for example, may successfully learn *how* to initiate a conversation with friends at school but continue to remain otherwise disinterested in peer interaction, playing predominantly by himself. A child such as Tom may choose not to engage in a particular social response despite the opportunity and ability to do so. In this example, we may say that Tom lacks motivation to engage in the social interaction.

Motivation is a complex concept, in which reinforcer effectiveness is influenced by a host of different variables, including the rate, quality, and magnitude of the reinforcers; delay to reinforcers; and the response effort to obtain the reinforcer (Davison & McCarthy, 1988). Consider, for example, the factors that might, on any given night, influence your decision to either go to a movie with friends or to stay home alone. You may consider how far you have to drive to get to the movie or how draining your work week was (i.e., response effort), which friends have asked and whether they are seeing a comedy or a horror movie (i.e., quality of the reinforcer), and whether they are seeing an early show or a late show (i.e., delay to the reinforcer). And while one factor may be the deciding one in your evaluation, it is equally possible that your ultimate decision may depend on an interaction of several, if not all, of the factors.

For someone with autism, social responding will be related to the same sorts of variables. For example, if Johnny has to wait until he gets home before he earns his reward for being social on the playground at school, the delay to accessing reinforcers may be too great, and may impede the response. Or, if the requirement to earn a tangible reward involves numerous challenging social responses simultaneously (e.g., initiate to five friends, avoid specific topics in conversation, stand at appropriate distance, make eye contact, etc.), the effort to obtain the reinforcer may likewise be too great. Faced with either scenario, a child with autism may choose not to engage in the targeted social behavior.

The potential impact of motivation on responding should not be underestimated, and clinicians must carefully and systematically consider, and regularly evaluate, how motivational variables affect social responding in particular (Hoch, McComas, Johnson, Guenther, & Faranda, 2002). Some practical applications and considerations may include:

- Are the reinforcers for social responding delivered at a sufficiently high rate? For example, if the student receives points for initiating play statements, are points being provided frequently enough?
- Is the reinforcer of sufficient quality? For example, when teaching a new social skill, is a better or bigger reward being used, one that is qualitatively better than rewards being used for other responses (e.g., using ice cream instead of a sip of juice)?
- Is the delay between the response and the reinforcer appropriate? For example, is the child required to initiate conversation with peers during recess and then have to wait until the end of the school day to receive praise and a reward?
- Does the social skill take too much effort, requiring too many responses simultaneously for the child to earn a reward? For

example, is the child expected to initiate conversation, track the person's facial expression to assess interest, make appropriate shifts in topic, *and* stand at the appropriate distance? Several responses that are individually manageable may together become unwieldy and too effortful for the available reinforcer.

Motivation Operations

In addition to the variables that can influence the effectiveness of a stimulus as a reinforcer, a learner's motivation to engage in a social behavior will be affected by Motivating Operations (MO) such as deprivation and satiation (Michael, 1993).

MOs alter the effectiveness of reinforcers or punishers, and, as a result, alter the frequency of specific responses related to those consequences. For example, if someone is sufficiently deprived of fluids and as a result is thirsty, they are more likely to engage in a response in order to obtain a drink (e.g., enter a store and purchase a bottle of water). Imagine how this might relate to social behavior. While doing yard work one morning, you greet your neighbor, who proceeds to tell you a long story about a vacation he just took. Later that day, you spot your neighbor in aisle three of the local market, and quickly turn down aisle two to avoid another episode of "small talk." In this example, "too much" social interaction with your neighbor that morning has decreased the likelihood that you will head down aisle three to initiate a greeting. You might be more likely to approach your neighbor and initiate a chat had it been a while since your last encounter.

In the same way, learners with autism will be influenced by general states of deprivation and satiation with regard to various stimuli. For example, a student is more likely to initiate play with a friend who is playing with one of his preferred toys if he has not recently enjoyed access to the toy.

From a practical and strategic standpoint, one can contrive motivating operations in order to increase a learner's motivation to engage in particular forms of social interaction (Sundberg, Loeb, Hale, & Eigenheer, 2002; Taylor, Hoch, Potter, Rodriguez, Spinnato, & Kalaigian, 2005). Consider the following:

- Try restricting access to certain preferred items, withholding them for use as rewards only when teaching the target social skill.
- Provide the learner with a preferred activity (e.g., a farm set), but remove a piece or item necessary to fully engage in the activity; then, teach the student to ask a peer for the missing item.
- Provide the learner with a toy that he enjoys but is unable to operate on his own (e.g., a mechanical top that spins); then, teach him to ask a peer for assistance in order to get the toy to work.

- Hide items necessary to complete a task, and teach the student to approach another person to ask where the items are.
- Place preferred toys in areas the child cannot reach, and teach him to ask a friend for help in retrieving the items.
- During snack time, have a peer control access to the child's preferred snack items, and teach the child to ask the peer for the snack.
- Give the student an activity that requires multiple pieces to complete (e.g., a puzzle), and have a peer control access to the items. Then, teach the child to ask the peer for each item to complete the task.

Specific Interventions

In addition to considering how to increase motivation, before beginning instruction, the teacher identifies a prompt that can reliably produce the social response. For example, if a child is being taught to say “Hi” when walking by someone in the hallway, the teacher would determine whether the student can imitate the word “Hi.” If so, the prompt is used to teach the student to respond in the presence of the more relevant discriminative stimulus (e.g., the presence of someone walking by in the hallway). Because the goal is to teach the learner to respond in the presence of the relevant stimulus, and not merely to imitate the target phrase, the teacher removes or “fades” her model of the response “Hi” so that the child initiates the greeting when approaching the person in the hallway rather than waiting to be prompted. There are a number of strategies outlined in the literature to promote responses and to fade and remove prompts over time.

Errorless Teaching: Time Delay and Most to Least Prompting Procedures

A common prompting strategy is a *progressive time delay*. In this technique, the instructor provides the prompt (e.g., a vocal model of the greeting) immediately upon the appearance or presentation of the relevant stimulus (e.g., the person the student is expected to greet). This procedure is repeated until the learner imitates the vocal model consistently in the presence of the relevant stimulus (the person whom he is greeting). Next, the instructor gradually increases the time—say, in two-second increments—between the presentation of the relevant stimulus (the presence of the person to greet) and the prompt (the teacher's vocal model). Once the learner can respond reliably with a significant delay (e.g., six or more seconds), the prompt may be removed

entirely. Time delay procedures have been shown to be effective in teaching a number of socially relevant responses, including statements of affection (Charlop & Walsh, 1986), and question-asking (Taylor & Harris, 1995).

Another strategy is “*most to least prompting*,” which involves systematically presenting less and less of the original vocal model. In our greeting example, an instructor transferring stimulus control by most to least prompting would slowly delete the final syllables or sounds of the prompt. In the case of “Hello,” the instructor would begin with the complete prompt, then shift to “Hell-,” “He-,” and finally “Hhh-.” As a final step, any remaining vestige of the prompt should be removed, so that the child produces the response “Hello!” without the instructor providing any portion of the model.

Time delay and most to least prompting procedures may be particularly beneficial in the early stages of a student’s learning process, as they systematically reduce errors and increase opportunities for a child to produce a correct response that the instructor may reinforce accordingly. At the same time, though, these procedures may lead to reliance on adults to initiate responses, particularly if the teacher has not effectively faded or removed prompts. The strategies listed below may increase independence because they reduce reliance directly on adults to initiate responses.

Script Fading Procedures

A script is a written word, phrase, or sentence that prompts a learner with autism to say or do specific responses in certain contexts. Imagine, for example, that Jane’s mom places in her daughter’s lunch bag a card with the written text, “Today my mom made me a sandwich for lunch.” At lunchtime, Jane’s teacher prompts Jane to take out the card, turn toward a peer, and read aloud the statement on the card. In time, and without any additional prompts from her teacher, Jane may independently remove the card from her lunch bag and read the comment to her friend. In this case, the written text prompts Jane’s comment, and the textual card has become a discriminative stimulus for the initiation of conversation toward a peer. Once Jane reliably and independently uses the script on the card to initiate the response, her mother would fade the script by removing portions of the text until the card was blank, and Jane was able to comment about what her mother made her for lunch when she removed her lunch from her bag.

A number of studies have documented that script fading may be useful in teaching such social responses as conversational statements to peers (Charlop-Christy & Kelso, 2003), attention gaining statements (Krantz & McClannahan, 1998), and comments about preferred snacks and leisure activities (Sarakoff, Taylor, & Poulson, 2001).

Audio-taped Scripts

Several studies document the benefits of using audiotaped scripts (Wichnick, Vener, Pyrttek, & Poulson, 2010). An audiotaped script is a recorded vocalization that is used to cue a child to make comments in certain contexts. Consider this example: When Brian is presented with a statement such as “I’m going somewhere,” his mother would like him to respond by asking, “Where are you going?” To help him learn this response, Brian’s mother could record the target response on an audio device. During teaching sessions, Brian’s mother would then present the statement “I’m going somewhere,” and immediately activate the recording device so that her son can hear the model and imitate the question. Across successive teaching sessions, Brian’s mom would then fade the audiotaped model—like a textual script—from the last to first word, until Brian independently asks the question when presented with his mother’s statement.

Of course, audiotaped models closely parallel “live” vocal models. There are, however, important distinctions. For one, audiotaped prompts, by totally removing the risk of human error, provide a consistency in content and inflection that is difficult, if not impossible, to achieve in an instructional program involving numerous teachers and participants. Likewise, audiotaped prompts may be faded without concern for human error or variations in inflection and tone. Moreover, learners using audio prompts may find it easier to distinguish the prompt from the natural discriminative stimulus. After all, a child learning to imitate either verbal or audiotaped responses must learn to discriminate between the stimulus that prompts his response—in our example, the mother’s announcement that she is leaving—and the verbal stimulus he should imitate—“Where are you going?” In most cases, learners with autism more readily distinguish between the live and recorded statements, and thus between the stimulus and the modeled response.

Incidental Teaching

Incidental teaching involves arranging the teaching environment in order to increase the initiations of the child with autism toward others in his or her immediate surroundings (Pierce & Schreibman, 1995). For example, a teacher may take all of the child’s preferred items and place them on a high shelf, or the teacher may have a peer hold access to a child’s preferred items. These intentional environmental modifications increase the likelihood of the child seeking out an adult or peer in order to access these items.

When the child initiates interest in the item or activity, the adult or peer uses the initiation as an opportunity to prompt a response of the child with

autism. The item or activity the child has initiated toward is then used as the reinforcer for that response. For example, a teacher may place a child's preferred items in view but out of reach; then, when the child shows an interest in the item, the teacher provides a prompt (e.g., a model) for a social comment about the activity (e.g., "Those are my favorite!" or "Do you want to play that video game with me?"). When the child imitates the model, the child is then provided with the activity and the child and teacher play together. Incidental teaching has the benefit of capitalizing on the child's apparent interests, thereby increasing his motivation to engage in the targeted responses.

Video Modeling Procedures

Video modeling procedures can be used to teach children a variety of socially related responses such as conversational skills (Taylor, Levin, & Jasper, 1999), social initiation skills, giving compliments, and making comments during play activities (MacDonald et al., 2005). Video modeling provides both a vocal and motor model for the child to imitate. For example, when teaching a child with autism and his peer to make statements related to a block building activity, a teacher might create a video of two adults building with blocks and making relevant observations about their shared activity (e.g., "Let's build a skyscraper!"). After watching the videotaped sequence several times, the child is provided with the same building materials used in the video. If the child has the prerequisite skills, he may initiate some of the vocal responses and actions that he viewed in the videotape. There are several variations of video modeling procedures in the literature, including the type of model, the frequency of viewing, and incorporation of reinforcers to shape imitative responses.

Pager Prompts

Pager prompts are vibrating pagers that serve as prompts for the child with autism to produce social responses (Taylor & Levin, 1998). Pager prompts permit instructors to deliver prompts from remote locations, without calling undue attention to the learner. Because they are inconspicuous and unobtrusive, pager prompts are a particularly apt method of teaching in contexts when traditional prompting methods might be socially stigmatizing.

At Alpine Learning Group, we use manually cued pagers which instructors can signal, at their discretion, when specific discriminative stimuli (e.g., a peer) are present, and a motivating operation in effect (e.g., the child picks up a novel toy). In this way, a student can be prompted to respond to a social opportunity by a distant observing teacher. Anecdotal reports sug-

gest that this procedure may be more effective in producing sustained levels of initiations even in the absence of the pager, because the pager's prompt has been specifically paired with the natural stimuli that should occasion the social response.

Selection of Interventions

When initiating social skills instruction, interventions are generally matched both to the skill level of the child with autism and to the specific skill targeted. It may be the case, for example, that certain skills such as answering social questions are most effectively taught in a structured format using discrete trial instruction, particularly if the student is an early learner who requires a good deal of repetition to master skills. In contrast, a child who is able to attend to and discriminate multiple stimuli simultaneously may be taught to initiate bids for joint attention in a play area where there are a wide variety of stimuli available. Thus, social skills interventions are individualized for each child, and often multiple interventions may be employed simultaneously with a given learner—depending on what is being taught. In other words, a child may be learning to answer questions with a discrete trial teaching format, while at the same time learning to initiate eye contact during incidental teaching activities. Thus, a number of factors are considered when choosing an intervention.

The Targeted Skill: Some interventions will lend themselves better to instruction of specific skills. For example, more structured interventions such as discrete trial teaching are beneficial for teaching component skills associated with more complex social behavior, such as answering questions, asking questions, or labeling emotions.

Prior Learning History and Responsiveness to the Intervention: If, for example, you are teaching an adult with autism to initiate greetings while at a worksite, it may be appropriate to use a textual script if the student has well-developed reading skills. If, on the other hand, the student cannot read, modeling or using an audiotaped script will be a more appropriate and effective intervention.

Context: Some interventions will be better suited for use in specific contexts. For example, in-vivo guidance and verbal prompts, even if effective in helping a preschooler with autism to learn to initiate toward peers in a typical preschool class, may prove socially stigmatizing in that context. The same types of prompts (e.g., in-vivo guidance and verbal prompts), however, may be entirely appropriate in an intervention aimed at increasing play statements with siblings at home.

Research Support for the Intervention: Empirical evidence often provides more support for using a given intervention to address a specific social skill, rather than another. For example, there is considerable empirical support demonstrating the efficacy of using textual scripts to teach scripted conversational statements. Likewise, research has established that video modeling is a particularly effective way to teach play-related statements to children with autism (for a review of interventions see Matson, Matson, & Rivet, 2007).

Generalization

Because children with autism have difficulty generalizing skills to novel settings, people, or stimuli, interventions should incorporate procedures to enhance the likelihood of generalization from the outset (Stokes & Bear, 1977). For example, when teaching a child to comment about toys, a variety of toys may be used to prevent repetition of comments about the same toys. Similarly, a variety of people may be used to teach the targeted skills to promote the child's responding across different people. It is likewise important to practice skills in different settings to enhance responding across environments and in the face of environmental changes. Thus, after initially teaching the targeted skills in the school environment, instructors may invite parents to help their child practice the skill at school before instruction proceeds to the student's home.

In some cases, instruction may first involve a specific set of stimuli, and only later will teachers incorporate procedures to enhance generalization. For example, when teaching a more challenged learner how to answer social questions, instructors may begin by asking the question in a specific way (e.g., "What is your name?"), rather than varying the form or content of the question from the start (e.g., "Who are you?" "And you are?", etc.). Over time, instructors introduce variations on the question while still expecting the same response. Similarly, when working with a young learner, a single response (e.g., "John") may initially be taught, and additional responses (e.g., "I'm John," "My name is John," "John Smith," etc.) are introduced over time. Additionally, in some cases, the assessment of generalization occurs with novel stimuli periodically during instruction. Thus, a child may be taught to initiate greetings in the hallway at school, and tests for generalization occur in other locations—the bus, the playground, or the lobby of the child's apartment building, for example.

Data Collection and Analyses

Data on social behavior are collected and analyzed to ensure that interventions are leading to desired changes in response. These may include changes in rate or frequency of responding within a period of time (e.g., the rate per minute of comments toward peers), the duration of a response (e.g., the duration of sustained play with parent), or the percentage of a particular response (e.g., the percentage of correct answers to social questions presented by a peer).

Data may also be recorded on the responding of typically developing peers as a way to determine age-appropriate and socially meaningful learning goals for the child with autism. For example, when designing an intervention to help the child increase the initiation of questions toward peers in a classroom, data are recorded on a typical peer's behavior in the same classroom to arrive at a reasonable goal for the child with autism. Baseline data are also recorded on the child with autism in order to correlate his actual skill level with the data on typically developing peers. The relationship of these two measures allows us to set a teaching goal that reflects both the child's ability and socially meaningful expectations.

Data collection and analyses are also ongoing components of a successful intervention. It is not always easy, however, to collect data on social behavior while simultaneously working to shape and transform that behavior. Imagine, for example, teaching a child to engage in conversation with a peer while also prompting her to make appropriate remarks, sustain eye contact, and respond to the peer's comments, all while taking data on the student's responses. Juggling so many tasks would be a challenge and likely to interfere with instruction. In such circumstances, teaching may take place across several sessions and a probe session is then conducted without prompts and reinforcers to assess performance.

Fortunately, technological innovations may be available to facilitate data collection. For example, it is now possible to videotape teaching sessions using a small, unobtrusive recording device, and to then review and record the data later. Similarly, computerized data recording programs and applications designed for handheld devices such as smart phones may make data collection more efficient, discreet, and portable.

Social Validity

As we've learned, social behavior is a complex phenomenon, but one which, using the techniques of applied behavior, may be conceptualized and

taught to individuals who lack such skills. And while the outcome of our interventions may be assessed using a variety of scientific measures, the true success of our teaching lies in its benefit to the individuals, families, and communities we serve. This means that in some cases, promising data may not necessarily represent a successful result. We may be able to teach a child with autism to initiate interactions with typically developing peers, but the initiations may fail if the peers do not view the responses we have taught as rewarding or meaningful. Peers are unlikely to reinforce such initiations, and ultimately the child with autism will fail to respond at all.

In the same sense, we may subsequently discover that our interventions have taught skills that lack an essential quality, and that the lack undermines their social meaning. For example, you may be able to teach a child to respond to someone's injury with a concerned statement such as "Are you all right?" but if the child does not make the statement with the proper intonation, the concerned message may be lost.

Thus, in social contexts it becomes particularly important to assess the social validity of our teaching outcomes. This may include weighing parents' or family members' opinion of the meaningfulness or functionality of the skills prior to teaching, or evaluating the skills once they are demonstrated. Social validity may also be assessed by soliciting community members to view video footage of a child's skills both before and after the teaching intervention. For example, instructors may ask a parent or sibling to watch videos of a baseline probe and then sessions conducted after the student has attained mastery of the target skill, and then to discuss the positive social changes, if any, they notice in comparing the two sequences.

Assessments of social validity may also be informal. For example, at Alpine Learning Group, adults with autism are employed in community-based worksites. In order to identify relevant learning targets, staff members observe social behavior common to the work environment and identify relevant objectives based on that context. Staff may also ask the individual's supervisors to share their impression of a skill once it has been taught: whether it is meaningful, how the skill might be improved, or whether another skill seems a more important target. Similarly, peers may be asked to rate or gauge the social behavior of a child after he has mastered the targeted skills. For example, for children who participate in inclusive educational environments, peers may be asked to provide their impressions of the child's social skills within specific contexts (e.g., "Do you like the games that Jane can play?").

Because social behavior involves complex interactions among many different responses (e.g., what is said, how it is said, and to whom it is said, etc.), seeking out independent evaluations of learned responses from several sources is essential in assessing the efficacy of our teaching interventions.

This information is indispensable, for although the dynamic fabric of our social community sets the occasion for teachers and behavior analysts to improve the social behavior of those in our care, it is our students' progress and skilled responding that reinforces our continued work in this area.

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