

# Applied Behavior Analysis: Addressing Cognitive and Emotional Development in Children with Autism

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It has become well known in recent decades that behavioral intervention procedures can be effective for teaching simple skills in the areas of language, socialization, self-help and academics to individuals with autism spectrum disorders (ASDs). However, far less attention has been paid to behavioral approaches for addressing complex cognitive and emotional skills. In fact, some professionals outside the behavioral community contend that complex cognitive and emotional abilities cannot or should not be addressed from a behavioral perspective. In this article, we will explain how this perspective is incorrect and is largely based on a misunderstanding of what Applied Behavior Analysis (ABA) is. Further, we will discuss how and why ABA is a useful perspective from which to address complex skills in individuals with autism and describe how many of us in the field have been doing this for years.

## Social Cognition

The autism community generally accepts the distinction between social cognition and executive functions. There is significant overlap between these two areas of functioning, but we will describe the two areas and how we address each separately. Social cognition refers to one person's ability to understand the mental states of others. Some refer to this ability as "Theory of Mind" or "mind reading" (Baron-Cohen, Leslie & Frith, 1985), while others use terms such as "perspective-taking." Whatever you call it, the ability to understand what it is like to stand in another's shoes is crucial for many areas of social and emotional functioning, including empathy, compassion, social problem solving and even just being a good friend or partner to someone.

A significant amount of research has demonstrated that many individuals with ASDs are impaired in their social cognition abilities. In the children and adolescents we treat, we often see difficulties in the following areas: 1) understanding others' emotions (identifying how others feel, what caused them to feel that way and what one should do about it in various situations); 2) understanding others' moment-to-moment desires (e.g., my friend and I have been talking about sports statistics for 20 minutes now and he is bored, so I should change the topic); 3) understanding others' long-term preferences (e.g., my mom loves chocolate ice-cream and hates vanilla, so I should buy her chocolate ice-cream for her birthday, not vanilla); 4) understanding deception (e.g., distinguishing between telling "white lies" as a joke or prank versus intentionally deceiving someone in a malicious way); 5) being able to identify what others can sense versus what oneself can sense (e.g., Grandma can't see the toy I'm holding up right now because she is on the other end of the phone, so I need to tell her what it is); 6) understanding what others know and that their knowledge is affected by what they are able to sense (e.g., Jimmy doesn't know I got a new puppy yesterday because he wasn't at the store with me, so I should tell him about it; Mom was there, so I don't need to tell her about it); 7) understanding others' beliefs and that

beliefs are not the same thing as knowledge (e.g., the difference between false and true beliefs, why a person might have one versus the other and how this affects how I might interact with them); and 8) understanding others' thought processes (what thinking is, how we talk about it, how it is different from doing and feeling, etc.). Any or all of the eight areas described above can be problematic for individuals with ASDs, depending on their unique histories and current circumstances.

## **Executive Function**

Executive function refers to the brain's control over goal-directed behavior. Areas of executive functioning that are commonly discussed include working memory, short-term memory, attention, inhibition, planning, self-awareness and problem solving (Ozonoff, Pennington & Rogers, 1991). The frontal lobe of the brain is often discussed as the location of these functions, and research has clearly demonstrated that damage to this area of the brain produces decrements in these functions. There is no doubt that healthy functioning of the frontal lobe of the brain is necessary for executive functions. However, the ABA approach to executive functions, like everything else that involves what people do, is to treat it as a skill. If at least some part of executive functioning is a skill that is teachable, then the principles of ABA may well inform how we understand and teach it. In fact, this is exactly what we have been doing for years.

Just as with social cognition, a significant amount of research has shown that many individuals with ASDs have impaired executive functions. Some of the deficits that we encounter are in the areas of: 1) attention (attending to what is relevant, maintaining attention over long periods of time, etc.); 2) short-term memory (e.g., remembering what occurred within the last 30 seconds or so); 3) working memory (keeping ongoing information online and being able to process it and do something with it a short time later, such as repeating a string of numbers back in reverse order); 4) inhibition (e.g., not attending to distracting and irrelevant stimuli, stopping oneself from doing something that will not produce a positive result, etc.); 5) flexibility (e.g., allowing oneself to perform a routine in a different sequence than normal); 6) self-awareness (e.g., monitoring and taking note of one's own actions, regulating one's own emotions, keeping oneself on task, etc.); 7) problem solving (e.g., what to do when your plan is not working, how to fix a toy, find something that is lost, etc.); and 8) planning (i.e., visualizing and stating an objective, vocalizing steps needed toward achieving it, taking those steps, monitoring one's own progress toward a goal, correcting oneself when errors are made, achieving the goal, telling others when appropriate).

This all sounds very complex and probably does not resemble what you have heard about what has been done in ABA programs in the past. However, the ABA approach lends itself perfectly to addressing these complex skills because the approach is inherently practical. Below, we describe how we go about using ABA to teach cognitive and emotional skills.

## **Doing What Works**

Most fields that deal with human affairs get bogged down in conceptual arguments over differing philosophical perspectives. Differences in ideology matter, of course, but the importance of these differences begins to shrink as one's time is spent arguing about philosophy instead of actually

fixing real problems and producing concrete results. One of the basic assumptions and major strengths of ABA is that what we do is valuable if and only if it produces a substantial change in a real-life problem. ABA is highly pragmatic in the sense that we do what works and we value an intervention procedure if it actually produces meaningful change. A basic assumption behind ABA is that a theory or philosophical position is of little value if it does not produce tangible, measurable results in helping others. For example, spending time arguing about different theories of language development is only useful if, after applying your theory, the child with whom you are working can actually ask for things when he/she wants them, comment on things that matter to him/her or engage in conversation with peers. If measurable changes in important skills are not produced, then one's theoretical perspective matters little, if at all. The term for this perspective is pragmatism: We do what works.

How then is the perspective described above applied to complex cognitive and emotional skills? The beauty of a pragmatic approach is that one knows when one has done something of value because a meaningful change has been produced in the thing that matters. In the case of complex emotional and cognitive skills, the thing that matters is the child with autism's ability to think, problem solve, self-monitor and understand the mental states of others.

## **Using ABA to Address Skills**

The ABA approach to cognitive and emotional skills is first and foremost to treat them as just that—skills. A skill is something that is learned and can be taught, if the proper training is used. It is not mysterious and magical; it is tangible, measurable and concrete. Some skills are more subtle than others. For example, pounding a nail is a skill, but it is certainly more straightforward than understanding the pain someone else feels when they lose a loved one, even though you perhaps have never lost someone. But the ABA perspective is: If it's something you do, it's a skill. We assume that there is a spectrum of subtlety and complexity that all human abilities fall on—some very concrete, some very subtle—but all are still skills or behaviors. Particularly subtle skills present the greatest challenges for teachers and clinicians, but they are not impossible to address, as we describe in the remainder of this article.

The first step in addressing complex cognitive and executive skills in individuals with ASDs is to decide on a measure of these skills that most would agree is meaningful. For example, if we want to measure a child's ability to understand his brother's preferences, even when they differ from his own, we might ask the child to plan a party for his brother. What games should be played? What music? What flavor of ice cream should be served?, and so on. Correct responding would indicate the child understands his brother's preferences and that they are sometimes distinct from his own. The next step is to analyze the skill you are testing into teachable units. For example, understanding others' preferences probably involves talking about them and identifying them when asked about them. The third step is to begin teaching particular examples of the skill you are trying to teach. Many years of research in ABA has demonstrated that the best way to teach a concept is to teach many different examples of it ("multiple exemplar training," in technical jargon), so that you avoid rote memorization of particular examples. After the child masters many different examples, the true test of whether he/she understands the concept is to test the child's ability with new examples that have never been taught, which will indicate whether or not the child understands the concept or whether he/she has only achieved rote memorization. For

example, if our goal is to teach a child to understand others' preferences (as opposed to his/her own), then we would teach the child to talk about and respond in an appropriate way to the preferences of many other people (Granpeesheh & Tarbox, 2008). In the end, if we have done our job well, the child will then be able to apply that knowledge to new examples with those same people and to new people with whom he/she was never directly trained. The technical term for this is "generalization" because the child is then able to generalize his/her newly learned skill across new people, settings and environments. This is how we know the child actually "gets the concept," and is not simply repeating scripted behavior.

## **Deciding What to Teach**

The areas of social cognition and executive function are enormous and it is not always obvious how to determine exactly what a child needs to learn in these areas and how those skills should be broken down into teachable units. For approximately 15 years now, we've been developing a comprehensive curriculum (the "CARD Curriculum") and a comprehensive assessment tool to be used alongside it (the "CARD Skills Index").

The purpose of the development of these tools is to make skills assessment and programming within ABA programs easier and more comprehensive. Without a comprehensive curriculum and assessment, the ABA practitioner is left to his/ her own skills and clinical experience to identify what to teach and how to teach it.

The scientific principles of learning and motivation and the teaching procedures that harness them receive much attention in the ABA community. However, far less attention is paid to the issue of what to teach. There is no doubt that expertise in teaching skills is critical, but even the most skilled teacher would be useless without meaningful knowledge of what to teach. For example, imagine a master teacher teaching a nonverbal child with autism to receptively identify words in Latin. How could that possibly benefit the child? Clearly, the content of what we teach is just as important as how we teach. Further integration of the various branches of psychology with ABA and additional development in curricula in the areas of social cognition and executive function will no doubt lead the way toward improvements in overall care for those affected by the disorder.

## **Conclusion**

Higher order social cognition and executive functions involve things people do, and the ABA approach helps us to understand and teach these critical skills. This approach is eminently practical because no time is wasted worrying about ideology. If a procedure works and allows a child to learn something valuable, then it is useful; if not, it is not worthy of our attention. We look forward to the future of ABA as it is applied to autism. Each day, scientists and professionals are stretching the limits of what was thought to be possible and, each day, one more piece of the autism puzzle is put into place.

## **References**

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