

Web-Based Radio Show

Developmental & Behavioral Approaches

Stanley I. Greenspan, M.D.

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Welcome to our Web-based Radio Show. Today is October 3, 2008. Thank you for joining us today.

Today we are going to talk about two basic approaches that characterizes the way we intervene with children with autistic spectrum disorders and other special needs conditions, but actually it's broader than that and actually has to do with educational philosophy or educational approaches in a more general sense for all children.

We talked a lot in the past about the DIR Floortime approach but the DIR Floortime approach is probably the most systematic and in-depth approach that might be thought of as an indication of a range of approaches that are used around the country and around the world now that focus on social interaction or social and emotional growth and development. These might be termed developmentally based social interaction approaches; to use an acronym - DSI (Developmentally based Social Interaction). These can be contrasted with the behavioral approaches which again have a number and range of approaches in it. It's usually described as one approach but it has Discrete Trial, which is the most intensive form of ABA or behavioral approaches; ABA stands for Applied Behavioral Analysis and actually that goes beyond just intervention – that's a way of looking at the world in terms of the way the child functions behaviorally.

By giving a little bit of the background of each of these broad approaches and the rationale each of the proponents of the approaches uses for the approach, may help clarify these two broad approaches and when we look at the evidence, and when we talked about evidence based interventions for children with autism and other special needs conditions, we can look at them now in terms of these two broad ways of working with children and families and what the strengths are of each one and what the vulnerabilities or weaknesses might be of each one.

We will talk first about the behavioral approaches because historically they were on the turf first; they were there early. As many of you know, Ivar Lovaas started with discrete trial approaches for children with autistic spectrum disorders way back in the




middle of the last century, and it was a big boost to our work with children with autistic spectrum disorders because he was more optimistic instead of seeing this as a condition where children couldn't learn or change; he felt that using the principles of behaviorism they could learn new behaviors. This is based on the work of B.F. Skinner who was one of the developers of Operant Conditioning and Skinner based his work on his teachers; they weren't necessarily direct teachers of his but they were intellectual teachers of people like Thorndike who worked with behaviorism at the turn of the century. The basic assumption of the whole behavioral movement – Thorndike, Skinner – and then applying it to children with autism – Ivar Lovaas; and the modern versions of ABA where there is a little bit more, actually, and more interestingly, more of a focus on incidental learning or using spontaneous opportunities for learning.

But the common feature going back historically to Operant Conditioning was that you could look at behavior in isolated units and the metaphor was used of the black box. You didn't have to know what was in the box, in the mind or in the brain; to change behavior and that behavior could be changed by looking at the conditions that preceded the behavior and the conditions that followed the behavior. The conditions that preceded the behavior were called "discriminative stimuli" and the consequences of the behavior, the conditions that followed the behavior were what were commonly called "the reinforcements" – they were the consequences.

So, for example, in the classic experiments of Skinner, you would have a pigeon learn to stand on his or her head and the way this would be done would be that when the pigeon would make a head movement in the slightest direction down, the first little spontaneous head movement down, a light would go off and then that would be followed by some food reward. So the pigeon would start pushing its head down a little bit to get the food reward but the light would "set the occasion for the reward" so the pigeon would quickly learn that when the light wasn't on, they weren't going to get the food pellet; that became the way the experiment was conducted and that was the way it was conducted. So the light would let the pigeon know when the reward was coming and when the reward was not coming. It's kind of like a teacher who rewards a child for sitting at their desk. When the teacher is not there, the child may not sit at the desk because they won't get the M&M, but when the teacher is there, providing an M&M every time the child sits at the desk, the teacher is the discriminative stimulus and the reinforcement is the M&M.

That's the basic paradigm for behavioral approaches. Then the behaviorists with their animal studies developed different schedules of reinforcement. If you reinforce a behavior every time it's performed, the learning of that new behavior is rapid; but also it can extinguish quickly if the series of reinforcements are not there; the pigeon or child will stop behaving. Then there are schedules of reinforcement which are more random




which are harder to predict and different kinds of intervals of schedules. So, for example, if you have a behavior under the control of a variable interval schedule where the pigeon cannot predict when they will get reinforcements but they know it comes some of the time, they will continue that behavior for a long time and even when you stop the reinforcements, the behavior will continue because, in essence, the pigeon doesn't know that the reinforcements have stopped because they were only coming at unpredictable variable intervals, some of the time. If you reinforce the behavior based on the number of responses and that is variable, but then the pigeon will respond very rapidly and keep pecking at a key or keep bobbing its head down until it's literally standing on its head. Very rapidly, you can get the maximum amount of reinforcements because it can't predict when it's coming but it knows the more it does the more the behavior may get reinforced.

When I mentioned the example before of the pigeon standing on its head, the way the pigeon learned to stand on its head is that the behavior is gradually shaped. It starts off with just putting the head down a little bit and then the pigeon gets reinforced for putting the head down a little bit more, and a little bit more, and a little bit more, until it's literally standing on its head – so the behavior is gradually shaped.

Now, with children, what we see is that behavior is gradually shaped in the same way. You want a child to be compliant and you want a child to stack blocks or find the right shape hole for the block to fit into, you reinforce the child for figuring it out; for doing the correct response and you can gradually shape a child's behavior – from making sounds to making more sounds – and that's the theory behind Applied Behavioral Analysis (ABA) as an intervention, and especially discrete trial approaches. It's based on the principles of behaviorism. Remember the assumption behind this is you can focus on isolated units of behavior without having to take into account what is going on inside the black box.

Now the strength of the behavioral approach is that it can target specific behaviors and bring them under control of these external reinforcers and discriminative stimuli. Certain types of behaviors such as compliance – sitting at a desk – for many children can be learned in this way. Also, problem behaviors like banging one's head against the wall or biting oneself might be discouraged by using this approach by reinforcing the opposite behavior. So if a child is banging their head, one might elect to reinforce a different kind of movement that has to do with giving hugs. Or, if a child is pacing, one might reinforce sitting. Compliance is often used as a first step in a shaping procedure in order to reinforce other behaviors.

Naturally, this model is attractive for children who were involved in lots of destructive behaviors and also who seemed out of control or who weren't learning.




Initially, when behaviorism was first used with children with autistic spectrum disorders, there was some aversive stimuli used too because you can use what's called "negative reinforcers." If, for example, an animal is on a shock grid, in other words if the floor is wired to give shocks, the removal of the shock can serve as a reinforcer just as the presentation of a food reward like an M&M or a food pellet for a pigeon.

The weakness of this approach is that it targets specific behaviors and human beings may be very different than pigeons or other animals in the sense that their behavior may not be isolated in the sense that one unit of behavior may not be related to another unit of behavior. Also, another weakness is the concept of the black box to try to understand children's or human being's behaviors independent of what's going on in the mind and the brain – the thoughts and the feelings that are part of the behavior and may even be motivating the behavior – although certainly you can work on feelings with a behavioral paradigm as well.

Perhaps the biggest vulnerability or weakness of this approach is that in and of itself, it does not derive from a development model. In other words, there is no theory or model guiding which behaviors are important to learn first, second, third, and fourth. In other words, what builds on what? Are there foundations for healthy human functioning that need to be mastered like the ability to engage with others or read and respond to social and emotional signals? Are those preliminary to or precursors to more meaningful language? In other words, is there a developmental sequence that has to be mastered or can behaviors just be selected in isolation?

When I first became acquainted with behavioral approaches and talked to a professor I had while I was in training who was an expert and researcher on behavioral approaches, he said, "Well, behaviorists use the green thumb." In other words, they used their own intuition and basically he explained to me that the model was to look at "what healthy children were doing" and model the behaviors after that. But he also acknowledged, and we discussed, the fact that the healthy children may have learned their healthy behaviors, again through a developmental sequence, not in isolation and so you may not be able to just jump from a child who is pacing the room and seemingly random and has no language to, so to speak, appropriate behaviors. You may have to build sequentially foundations for healthy functioning.

Also, if we look at the research on behavioral approaches, we see that a lot of the research is based on single cases or very small groups of individuals; human beings, but more importantly, the outcomes measured are specific behaviors; not broad developmental outcomes like social and emotional functioning. And if you look at the criteria for defining autism and what is autism, it has to do with a lack of engagement and




social interaction and the ability to read and respond to emotional and social signals and to use language creatively and meaningfully. And these are rarely used as outcome measures. There are a few behavioral studies that have but these are rare. Usually, it's specific targeted behaviors that are used as the outcomes or educational outcomes having to do with academic skills or other skills that may not be part of the definition of autism.

So are you really focusing in on the core characteristics and changing those when you look at the outcomes? When you apply broad principles and look at all the research done on behavioral approaches, one sees that the outcomes for social and emotional functioning, or what might be called developmentally meaningful functioning, is very, very weak and in many, many studies, there are indications of no changes in these capacities. The well-known study by Smith and colleagues- Smith was a lieutenant of Lovaas and worked closely with him and was a big proponent of behavioral approaches, but he did the first real random assignment clinical trial study of behavioral approaches, published it in 2001, and he found that there were only modest educational gains and little to no emotional and social gains and was unable to replicate the original Lovaas study of 19 children. So, these are some of the vulnerabilities or weaknesses on the behavioral side.

In summary, it should be thought of with a series of questions. One – can you take approaches developed from animal studies and apply them to humans that readily? Two – can you help children without building healthy developmental foundations?

Before leaving behavioral approaches we should indicate something we mentioned before – that there are many different approaches within the behavioral schools, so to speak, or that are used in the behavior framework. The most intensive is discrete trial which follows pretty much the format I have been describing but also there is a number of other approaches such as pivotal response training which really tries to focus more on incidental or spontaneous learning; still using behavioral principles, reinforcing the appropriate "behaviors" but taking advantage of natural situations that occur. It comes closer to what we're going to describe in a moment as the developmentally based social interaction approaches. So there is kind of a gray zone forming where a number of proponents of behavioral approaches are moving more and more towards social interaction but using behavioral principles to describe what they're doing rather than developmentally based social interaction models to describe what they are doing.

Sometimes you have to watch carefully what is actually being done between the educator or the caregiver and the child to know what approach is actually being applied. And also, more and more, even the strongest proponents of behavioral approaches are




using social interaction approaches during breaks or during times when they are not doing the formal behavioral paradigm with the children.

Also, it should be clarified that the broader model of applied behavioral analysis using behaviorism as a tool of analysis is a way of looking at the environment and how it is setting up conditions for reinforcement that may not be obvious to the adults in the environment. Using it as a model of analysis is different than using it as a model of intervention because it may not be translated directly into that.

But now let's describe what we're calling developmentally based social interaction approaches. In the last 20-30 years, we have learned a great deal about how the mind and the brain develop. In our DIR Floortime Model, which I will use as an example because it builds on modern understanding of the way the mind and the brain develop, we have learned that the mind develops and actually the brain follows along pretty closely, in a certain sequence. In other words, children build foundations for healthy social, emotional, and intellectual functioning and we can now describe the steps through which children learn or infants and toddlers and preschoolers learn and master. We can now describe these healthy foundations and how they occur; and we have described six basic foundations and then three more advanced ones.

Those six basic ones which are well known to many of you are the ability for shared attention and being calm or regulated; the ability to engage with others builds on that after the baby can look and listen and take in the world. They can engage with primary caregivers with warmth and intimacy, and the ability to interact with their caregivers and read and respond to emotional and social signals – build on that between, for example, four and ten months. And once a baby can interact and read and respond to social and emotional signals (facial expressions and other gestures), they learn what we call social problem solving. This has also been described as joint attention where children are playing with a toy and a caregiver at the same time. They are taking the caregiver over to the shelf to get the toy by pulling them on the hand and there are many back-and-forth interactions that characterize this. So now we have a continuous flow of social interaction with a caregiver, all towards solving a problem.

And if this goes well, as we have described in our book *The First Idea: How Symbols, Language, and Intelligence Evolved from Our Primate Ancestors to Modern Humans*, this capacity for a long chain or a continuous flow of back-and-forth social and emotional interactions enables the toddler to separate what they see from what they do; they are no longer under the mercy or under the control of fixed perceptual motor patterns or fixed reaction patterns; they no longer see something that makes them angry and fly into a rage; they no longer see food and have to grab it or see mommy and have to




hug her immediately. They are free from basically these fixed reactions and they can now signal and interact with negotiation. They can negotiate their anger, their love, they can flirt, they can size things up, and they can operate in patterns. And this ability to separate perception from action or free themselves from these fixed fight-or-flight reactions, or what I call sometimes catastrophic reactions, enables them to have free-standing perceptions or free-standing images that are free from fixed behaviors and this allows them to develop ideas; more meaningful symbols. So an image of mother no longer fixed with either rage or fixed with either a hug or food as an immediate expectation or response becomes a free-standing image and now mother can be invested with all the emotional interactions one has with mother – pleasurable, frustrating, enticing, curious, etc., etc., etc. and mother becomes a meaningful symbol.

This leads to the next foundation which is the creation of ideas or the creation of meaningful ideas and that leads to the meaningful use of language – “Mommy I want a hug.” “Mommy give me the juice please now.” And once we have ideas, the child can learn to connect ideas. “Why do you want the juice?” “Because I’m hungry.” And then this leads to more advanced levels of thinking, what we describe as multi-causal thinking, comparative and gray area thinking, and finally reflective thinking where the child can actually evaluate their own behavior and feelings and we have described these in some detail before and in our different books.

Why am I focusing on these developmental foundations? Because the developmentally based social interaction approaches work on building healthy foundations for human development. Now different ones may focus on different elements. In the DIR Floortime Model, we try to focus systematically on all these fundamental building blocks. I will describe that in just a moment, but there are a range of approaches some of which only focus on some of these healthy building blocks but what they have in common is the developmentally base social interactions that are facilitative of one or another or all the healthy building blocks for emotional, social, and intellectual functioning.

So developmentally based social interaction approaches foster these important building blocks of healthy emotional and social and intellectual functioning. They focus on the ability for social interaction, the ability for thinking, the ability for reading and responding to social and emotional signals. Again, in our DIR Floortime Model we focus on all these. We also focus on individual differences in the way children process sensations because children with autism are different in the way they have developed a receptive or expressive language skills; they’re different in the way they respond to touch or sound – some are hyper-responsive, some hypo-responsive, some seek out different sensations; they also differ on their motor skills – what we call motor planning and




sequencing; some are advanced, some have challenges in this area. And they differ on how they comprehend what they see – some tend to get over-focused on the trees, some can see the whole forest; some have very good visual memories, others weak visual memories; some can problem solve off of what they see like search for hidden objects, others have a hard time with that.

So in the DIR Floortime Model we focus on building healthy foundations for emotional, intellectual, and social functioning but we also focus on the individual processing differences of the children, hence the "I" in the DIR Model – individual differences. So it's building healthy developmental foundations (D), focusing on individual differences (I), and creating relationships (R) which focus on the child's profile of individual differences to build the child further and further up or create opportunities for the child to build themselves up the developmental ladder, to a higher and higher levels of healthy developmental foundations.

Other social interaction approaches have similar goals but they, again, may focus more on engagement and more on just reciprocal interaction or more on pragmatic and meaningful language, or in creative use of language. What they have in common is the focus on social interaction and the few other things they have in common. They are child centered in the sense they take their lead from the child. They work off the child's natural interests or emotions of the moment and attempt to teach the child new capacities from what the child is already interested in. So if a child is opening and closing a door and our DIR Floortime Model we want to create social interaction – we'll get stuck behind the door and make a game out of it where out of a perseverative behavior comes an interesting social interaction.

A child who is moving a car back-and-forth – we'll move a car with the child or see how our dolly can go for a ride in the child's car, trying to create a pretend play off of the child's natural interests. Again, trying to follow the child's lead; follow the child's emotional inclinations. So these child-centered or emotionally based approaches are common to one another in the sense that they take the lead from the child. It doesn't mean they don't set limits; it doesn't mean they don't try to apply structure when necessary or needed. It means that in building the healthy developmental foundations for functioning, they realize the importance of social interaction as a characteristic of all the foundation pieces because when you take it down and try to summarize it, and you look at our six fundamental milestones, and even our three more advanced ones in our DIR Floortime Model, they all have in common social interaction.

A newborn baby learning to look and listen is in a playful game with mommy where she's moving her head to the left and the right; she's then enticing the baby into



engagement; then she's responding to the baby's smile with a smile back and the baby sounds with a sound back; creating back-and-forth social interaction. In shared social problem solving, daddy is taking advantage of Johnny's desire for a toy by becoming a social partner and searching for the toy and responding to Johnny's gesture to be picked up to reach for the toy. And in joining the child who is playing with a car with a little girl doll who wants to go for a ride in the car, again, we are creating social interaction but now it's at the level of pretend play.


Social interaction is a characteristic of building these healthy foundations and building meaningful language and intellectual and social functioning. So the strength of this model is it comes from a theory of how the mind develops. It builds meaningful social interactions.

Another strength is that it also focuses on the characteristics that define autistic spectrum disorders and other special needs conditions in terms of trying to build the healthy foundations that will reverse the problems. Since children with autism have difficulty with engaging, with being part of reciprocal social interaction, i.e. reading or responding to social or emotional signals in a back-and-forth way, and using language meaningfully and creatively, all the social interaction approaches focus on these critical challenges, attempting to strengthen the child's abilities to master these challenges with the healthy developmental foundations to replace the problematic ones.

And problem behaviors like perseveration or aimless behavior are approached not from the point of view of deconditioning the behavior but creating a healthy developmental foundation that's the opposite of the behavior. So meaningful social interaction replaces a perseverative interaction – rather than opening and closing the door we now have a playful game where daddy is being told to "go" or there's giggle when daddy gets stuck behind the door and little Johnny says "move" and so forth and so on.

Developmentally based social interaction approaches as a group also uses the team approach, where as part of the overall therapeutic program there is speech therapy, occupational therapy, educational services; and also often there's a very strong home component so the child is receiving opportunities for social interaction often through playful interactions all day long – at home as well as also there's opportunities for peer play. In our DIR Floortime Model, biomedical approaches are also included in the overall model of developmentally based social interaction approaches.

The strength of this model as I indicated is that it works on building healthy foundations for development; deals with the core deficits associated with autistic spectrum disorders and other special needs conditions; and when we look at the research on social interaction approaches, the outcomes looked at are these important




developmental foundations. The outcomes are the mastery of the core deficits of autism and other special needs conditions – like reciprocal social interaction, engagement, and creative and meaningful language.

Now when looked at as a group, these social interaction approaches must have considerable evidence behind them. Each one of the approaches has some research behind it. They haven't been around as long as the behavioral approaches so there are not as many studies, but the studies that have been done, and if you take them collectively, show that children can, to varying degrees, master these critical developmental foundations. That's most important – they can improve in terms of beginning to overcome, or actually significantly overcome the core deficits associated with autistic spectrum disorders.

They also are heavily family oriented, family related; so they bring in the family into the picture as co-leaders in the program. And there is considerable evidence for them. When the National Academy of Sciences reviewed all the approaches for autistic spectrum disorders, they listed ten that had some evidence behind them; and they listed the developmentally based social interaction approaches – what they call developmental approaches as one group, and behavior as another group and they said there were no comparative studies and both had some evidence behind them. They had the DIR Floortime as an example of a developmentally based social interaction approach.

Since then, other reviews of the literature suggest a similar conclusion. So we have these two broad approaches now – the social interaction approaches, or developmentally based social interaction approaches, and the behavioral approaches. They each have strengths and they each have some weaknesses. The weaknesses of the developmentally based social interaction approaches are: 1) it requires often considerable family and parental involvement, which I actually view as a strength but some may view as a weakness because it demands a lot from the family; and 2) it requires skill – it's harder to learn and those who help the family organize such an approach often require more training than someone who is practicing a behavioral approach where the paradigm is not quite as complex; it has a little less challenge associated with it; and 3) it's harder to measure the outcomes because the developmentally based social interaction approaches look at healthy social, emotional and intellectual functioning for which there are less measures than there are for simply changing behaviors or accounting behaviors. All of these are challenges or might be considered vulnerabilities in this approach.

But the strength is it builds healthy foundations and the goal is the same goal we have for all children – healthy functioning. So it's important to look at both behavioral



approaches and developmentally based social interaction approaches as two groups with different assumptions emanating from different traditions. Now the tradition from the developmentally based social interaction approaches is the modern understanding of how the mind and the brain develop. The tradition of the behavioral approaches is actually the opposite – the throwing the mind out, in essence, looking at behavior without considering the "black box" starting with the turn of the century, and look at behavior in discrete units. One is based on a conditioning model; one is based on a developmental child development model.

So we have critical differences in the two models and when we look at modern education and when we look at work with children with special needs and especially autistic spectrum disorders, we have to consider the history and tradition of these two models.