

**RESEARCH SUPPORT FOR A COMPREHENSIVE DEVELOPMENTAL APPROACH
TO AUTISTIC SPECTRUM DISORDERS AND OTHER DEVELOPMENTAL AND
LEARNING DISORDERS:
The Developmental, Individual Difference, Relationship-Based (DIR™) Model**

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Autistic Spectrum Disorders (ASD) and other disorders of relating and communicating often involve a number of different challenges or problems. Each child, even though he may share a common diagnosis with other children, has his own unique pattern of development and functioning. A comprehensive approach to assessment and intervention must work with each child's and family's individual differences. These include differences in capacities to attend, relate, communicate, and think, and to process experience and information and plan and sequence actions (i.e., sensory processing and motor planning).

For example, some children are over reactive to sensations, such as touch and sound, while others are under reactive. Some children have relatively strong auditory memories (memorizing entire scripts), while others have relatively weak auditory memories, but relatively strong visual memories. Some children are able to sequence and plan a number of actions in a row, while others are only able to carry out one action at a time (often becoming very fragmented in their behaviors).

In addition, children differ in their basic mastery of the foundations for relating, communicating, and thinking. Some children with autistic spectrum disorders can form relationships and be engaged in purposeful social interaction to a limited degree, while others are very self-absorbed and aimless. Some children can focus and attend, engage with others, exchange motor and affect gestures in a purposeful manner, but have difficulties participating in a continuous flow of affect gesturing as part of social problem-solving. These children also then have difficulties with the meaningful use of ideas and language and in connecting ideas together for logical and reflective thinking. Other children evidence partial mastery of the basics, as well as shared social problem-solving and the creative and logical use of ideas, but are very limited in their capacity to apply these abilities to a broad range of interactions. Therefore, while some children may share common features that lead to a diagnosis of an autistic spectrum disorder, their individual patterns are quite varied.

Children with ASD typically have challenges at two levels. At one level, they have compromises in the basic foundations of relating, communicating, and thinking, such as a difficulty with exchanging emotional and social signals as part of a relationship. At a second level, they frequently evidence symptoms such as repetitive behavior, self-stimulation, and self-absorption.

Emerging modern developmental, relationship-based approaches for children with ASD and other disorders of relating and communicating attempt to help children master both levels at the same time. Work on the basic foundations of relating, communicating, and thinking (as well as advanced levels of these capacities) helps a child master the most fundamental building blocks of healthy emotional and intellectual functioning. Strengthening these basic foundations, in turn, enables the child to master symptoms, such as self-stimulation, perseveration, and self-absorption. For example, as a child learns to engage and enjoy being part of a relationship, she decreases her self-absorption. As a child becomes engaged in spontaneous, two-way communication and social problem-solving with gestures, she decreases her perseveration. As a child learns to use gestures and words to regulate relationships and his environment, he uses less self-stimulation. Therefore, as symptoms are being mastered, the child is developing the essential foundations of healthy emotional and intellectual functioning. The children are relating with warmth and trust, communicating intentionally, engaging in social problem-solving, and

learning to use ideas creatively and logically. As indicated, these are the cornerstones, literally, the definition of healthy development.

This approach is consistent with recent research that shows that when children with autism are compared to children without developmental challenges and matched for IQ scores, what separates them is their ability for abstract, reflective thinking, including making inferences; engaging in reciprocal affect interactions as part of a continuous flow of interactive problem-solving; and evidencing high levels of relatedness and empathy (Minschew & Goldstein, 2000).

In order to work with the foundations for relating, thinking, and communicating, modern developmental approaches attempt to tailor the approach to each child's unique developmental profile, including his relative level of mastery of the stages of relating, communicating, and thinking and his unique ways of processing experience and information and planning actions. Whether at home, with the family, at school with educators, or in other settings, emotionally meaningful learning relationships are constructed. These learning relationships meet the child at the level of his capacities for relating, thinking, and communicating, and are geared to his unique "processing" patterns. For example, a sensory under reactive child who is not yet fully related is wooed into pleasurable relationships with a pattern of affective and sensory engagement that helps him enjoy relating. He is then helped to learn to interact and communicate in a purposeful manner. In contrast, a sensory over reactive child is approached with extra soothing. If this child is already related and purposeful, but not yet engaged in a continuous flow of social problem-solving interactions with gestures or words, he is helped to sustain long chains of creative, problem-solving interactions. Each child is not only helped to master "the basics," but to want to master the basics. Learning relationships are constructed to challenge the child to experience satisfaction and enjoyment in mastery. The goal is to help each child "climb his developmental ladder." Gains in the "basics" such as relating and thinking, influence a wide range of behavior (each basic capacity has an enormous number of behaviors associated with it) and tend to generalize readily into a variety of settings.

In contrast to modern developmental approaches, older approaches tend to focus on changing surface behaviors and symptoms without attention to underlying individual differences or the missing basic foundations of relating and thinking. Behavioral approaches, including the widely used ABA Discrete Trial approach, are examples. While early reports on this approach suggested positive educational gains for children with ASD, in the only rigorous scientific study (employing the clinical trial method with random assignment of children to the intervention group) Tristram Smith reported results showing only modest educational gains and little to no emotional or social gains for very structured behavioral approaches. This study, published in the American Journal of Mental Retardation (Smith, Groen, & Wynn, 2000), is in contrast to the widely publicized 1987 study claiming greater success rate for these methods (Lovaas, 1987). The 1987 study, however, has been criticized for not using proper scientific design, i.e., the clinical trial method with random assignment of children to the intervention group.

The National Academy of Sciences, in its 2001 report "Educating Children with Autism," states that there is research support for a number of approaches including developmental, relationship approaches and behavioral approaches but that there are no proven "relationships between any particular intervention and children's progress" (page 5) and "no adequate comparisons of different comprehensive treatments" (page 8). The National Academy of Sciences concludes that "effective services will and should vary across individual children" depending on individual child's and family's needs (Committee on Educational Interventions for Children with Autism, 2001). Policy makers need to know that research supports a number of approaches and that the goal is to tailor services to a child's unique set of needs.

The National Academy of Sciences analysis further indicates that behavioral interventions are moving away from highly structured approaches to "approaches using naturalistic teaching methods...They are initiated by the child, focused on the child's interest...imbedded in the natural environment and they use natural reinforcers that follow what

the child is trying to communicate...Studies have reported that naturalistic approaches are more effective than traditional discrete trial at leading to generalization of language gains to natural contexts.” (Koegel, Camarata, Valdez-Menchaca, & Koegel, 1998; McGee, Krantz, & McClannahan, 1985)

The Academy points out that these contemporary behavioral approaches are becoming more and more similar to developmental, relationship-based approaches focused on working with children and families’ individual patterns with the goal of creating learning relationships that build the foundations (that have often been missing or dysfunctional) for relating, communicating and thinking.

The National Academy of Sciences used ten comprehensive programs as models that had evidence of being effective. Three are developmental, relationship and family support-based, two are very structured behavioral programs, and four involve combined elements including a movement toward more naturalistic teaching methods. One of the programs has its own unique educational framework.

One of the models cited by the Academy of Science’s analysis as illustrative of the developmental, relationship-based models is the Developmental, Individual Difference, Relationship-based approach (DIR). This approach, which is often referred to as “Floortime” (which is actually a specific strategy within the broader DIR model) constructs a comprehensive intervention program with the goal of strengthening individual processing capacities such as auditory processing and language, motor planning and sequencing and building core functional development capacities that contribute to the foundations for relating, thinking, and communicating. The functional developmental capacities include the ability for shared attention, engagement, reciprocal emotional interactions and the creative and logical use of ideas. In a review of 200 cases this approach has been shown to help the vast majority of children to become engaged, trusting, intentional and communicative with a sub group of children able to develop capacities for high levels of creative and reflective thinking, peer relationships, empathy and academic mastery (Greenspan & Wieder, 1997).

In analyzing the research on the different models cited by the Academy, it’s useful to look at the types of gains observed and reported for the different models. For example, behavioral approaches have tended to focus on educational outcomes, measured by structured performance-based tests and change in surface symptoms, such as perseveration and self-stimulation. Relationship-based, developmental approaches have tended to focus more on relationships, social skills, and meaningful, spontaneous use of language and communication. The relationship-based, developmental model—the DIR (Floortime) approach—is unique in showing gains not only in the basic social and emotional functioning of relating, interacting, and communicating meaningfully, but for a subgroup of children, in the attainment of capacities often thought to be beyond the reach of children with autistic spectrum disorders. These include the capacities for making inferences, engaging in high levels of empathy, and enjoying age-expected peer relationships.

In general, there appears to be a relationship between the practices involved in an intervention approach and the type of gains that one observes. It’s perhaps to be expected that a child will develop the skills or capacities that are practiced. Therefore, more structured approaches have tended to be associated with being able to perform under structured conditions, while relationship-based, developmental models have tended to be associated with more spontaneous social interactions and meaningful language and communication.

Developmental, Individual Difference, Relationship-Based (DIR_{tm}) Model

The Developmental, Individual Difference, Relationship-Based (DIR_{tm}) approach is a comprehensive model that identifies the individual differences (i.e., the strengths and weaknesses) of particular children and their families. It provides a framework for taking into account the child's and family's unique developmental profile. The DIR approach is often thought of as a specific intervention. However, as indicated, it is a model of analysis that helps to identify the child's and family's profile. Thereby, it provides a framework to orchestrate many specific interventions as part of a developmentally-based, comprehensive program of assessment and intervention. The components of the DIR model of analysis include the following (Greenspan & Wieder, 1999; 1998; Interdisciplinary Council on Developmental and Learning Disorders Clinical Practice Guidelines Workgroup, 2000; Greenspan, 1992):

- Functional, emotional developmental capacities
 - Regulation and interest in the world
 - Engaging and relating
 - Intentionality
 - Problem-solving, mood regulation, and a sense of self
 - Creating symbols and using words and ideas
 - Emotional thinking, logic, and a sense of “reality”
- Motor and sensory processing capacities
 - Auditory processing and language
 - Motor planning and sequencing
 - Visual-spatial processing
 - Sensory modulation
- Caregiver-family/child interactions, which bring the child's biology into the larger developmental progression and can contribute to the negotiation of the child's functional developmental capacities.

The DIR model and approach, as the above outline suggests, identifies the areas of functioning that need to be included in a comprehensive assessment and intervention program. As indicated, such a program includes a number of different elements. Broadly speaking, these elements focus on the importance of:

- Relationships and emotional and social interactions for facilitating emotional and cognitive growth and development;
- Different biologically-based processing capacities, such as auditory processing and language, motor planning and sequencing, sensory modulation, and visual-spatial processing.

Research on the Components of the DIR_{tm} Model

To analyze the research support for this model, we looked at the research on each of these elements. They are reviewed in Chapter 31 of the *ICDL Clinical Practice Guidelines*, “Evaluating Effective Interventions for Children with Autism and Related Disorders” (Available at <http://www.icdl.com>. Also see Attachment 1.). This review shows that there is a great deal of research supporting the importance of relationships and emotional and social interactions in facilitating emotional and cognitive development. There is also a great deal of support for interventions that work with auditory processing and language functioning. There is significant support, but less than for the two areas listed above, for interventions that focus on motor planning and sequencing and executive functioning, sensory modulation, and visual-spatial processing.

In a recent study on the new Bayley Scales of Infant and Early Childhood Development, a parent questionnaire on the DIR-Functional Emotional Developmental Capacities (FEDC) was field tested and found to discriminate between infants and young children with problems and disorders and those without. The study also validated the age predictions of the DIR-(FEDC). The parent questionnaire on the DIR-(FEDC) will be part of the new Bayley Scales kit. Furthermore, in a recent national health survey to over 15,000 families, the federal government's National Center for Health Statistics used questions on the DIR-(FEDC) and found that it identified 30% more infants and children at risk (most of whom were not receiving services) than prior health surveys (Simpson, Colpe, & Greenspan, 2003). This was the first time these functional emotional developmental capacities or any type of emotional variables were used in this national health survey.

Therefore, there is a great deal of support for the critical elements that comprise the DIR model. It is also interesting to note that brain imaging studies demonstrate that emotionally salient learning interactions result in more integrated central nervous system learning experiences than more circumscribed or impersonal learning experiences.

Study of 200 Children Receiving a DIR_{tm}-Based Assessment and Intervention Program

We reviewed the charts of 200 children with ASD who were receiving a DIR-based program. Each child was assessed from the perspective of the parameters of the model described above and a comprehensive program was constructed that tailored the approach to the child's unique developmental profile. Each child's program involved many elements (e.g., speech and language therapy, occupational therapy, an educational program, and a very intensive home program). All the elements, however, involved tailoring learning interactions to the child's functional emotional developmental capacities and individual processing differences. They differed from many other intervention approaches in their focus on helping children and families build the foundations for relating, communicating, and thinking that had been derailed. The results of this chart review (Greenspan et al., 1997) showed that:

- The vast majority of children receiving the DIR approach learned to relate and engage with warmth, trust, and intimacy.
- The vast majority learned to interact and read and respond to social signals.
- A significant subgroup of the children were able to develop not only strong relationship and interactive capacities, but capacities for imaginative play, creative and meaningful use of language, and reflective thinking, including high-level capacities for empathy, making inferences, and mastering complex social and academic challenges.
- This subgroup of children are in regular schools, have warm, meaningful, pleasurable friendships, and many have levels of understanding and empathy significantly beyond their peers.
- It should be noted that the capacities for empathy and high-level reflective thinking involving making inferences had been thought to be beyond the reach of children who are diagnosed with autistic spectrum disorders.

Research on Relationship-Based Approaches

In addition to the study cited above, there is a considerable amount of research emerging on relationship-based approaches that incorporate fundamentals of the DIR model. These are showing very positive results for children with autistic spectrum disorders. For example, the Michigan PLAY Project has just analyzed the results of a parent consultation adaptation of the DIR model and found significant gains for a group of children with autistic

spectrum disorders in social, cognitive, and language functioning (Solomon, Necheles, Ferch, & Bruckman, 2003).

Another model, which is based on a developmental and relationship framework, began in 1981 at the University of Colorado's Health Sciences Center as the "Playschool Model." In 1998, it shifted the focus to home and preschool environments involving typical peers as well. A number of studies on this model have shown significant gains in emotional, social, and cognitive development (Rogers & DiLalla, 1991; Rogers, Hall, Osaki, Reaven, & Herbison, 2000).

Selected references on the research on relationship-based approaches are listed after the conclusion.

Conclusion

In summary, current research suggests that modern developmental, relationship-based approaches to working with children with ASD and their families focus on the goal of strengthening or constructing the functional developmental capacities for relating, communicating, and thinking. To accomplish this goal, modern approaches work on creating emotionally meaningful learning interactions that are tailored to each child's and family's developmental profile. The DIR model is a method of analysis that enables parents, educators, and clinicians to construct a comprehensive, developmentally-based program. Two accompanying articles describe the DIR model in a bit more detail and how to integrate other relationship-based approaches into the overall DIR approach.¹

Selected References That Support Relationship Based, Developmental Approaches

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¹ See "The Developmental, Individual Difference, Relationship-Based (DIR_{tm}) Model," by Stanley I. Greenspan, M.D., Serena Wieder, Ph.D. and "Integrating Relationship and Social Skills Approaches into the DIR Model," by Stanley I. Greenspan, M.D.

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