

Evidence Base for the DIR®/Floortime Approach

Executive Summary

The following article provides support of DIR®/Floortime as an “evidence-based practice.” The challenges to measuring effectiveness of the approach for children with autism include the targets of the intervention, which are core deficits or underlying capacities, rather than isolated behaviors, and the diversity of the population with a diagnosis of autism. Research has focused on the three major aspects of DIR®, i.e., Developmental framework, Individual Differences, and Relationship-based intervention. Outstanding research in each area is highlighted. In addition, an area of research has focused specifically on the integrative aspects of D, I, and R and the investigation of complex systems. On-going studies are evaluating the effects of intensive DIR therapy on overall brain function. The article also summarizes critical reviews of all research in the field for both ABA and DIR®/FT approaches, and current recommendations for future research paradigms. In addition to research, the article also cites current clinical use and acceptance of DIR®/Floortime by major organizations. In conclusion, DIR®/Floortime has a solid foundation of research and clinical experience support, and can be considered both “evidence-based” and also a prominent therapeutic option for children with disorders of relating and communicating.

Evidence Base for the DIR®/Floortime Approach

8-31-09

Diane Cullinane, M.D., FAAP
Diplomat, American Board of Pediatrics
Diplomat in Developmental-Behavioral Pediatrics
Diplomat in Neurodevelopmental Disabilities
Faculty, Interdisciplinary Council on Development and Learning Disorders

Due to the recent budget cuts in California, the ‘evidence’ to justify public funding for DIR®/FT programs is currently under scrutiny by regional centers in California. This article attempts to summarize the most current research evidence pertaining to the DIR®/FT approach, which will not only provide sufficient basis for a determination that DIR®/FT is evidence-based but will also present an historical view that shows that the field of intervention for children with PDD is shifting from more behavioral approaches towards more developmental models overall.

From Trailer bill: “Evidence-based practice” means a decision making process which integrates the best available scientifically rigorous research, clinical expertise, and individual’s characteristics. Evidence-based practice is an approach to treatment rather than a specific treatment. Evidence-based practice promotes the collection, interpretation, integration, and continuous evaluation of valid, important, and applicable individual- or family-reported, clinically-observed, and research-supported evidence. The best available evidence, matched to infant or toddler circumstances and preferences, is applied to ensure the quality of clinical judgments and facilitates the most cost-effective care.

What to measure?

A starting point to measure effectiveness of intervention is to determine the factors to be measured. This is a major challenge in the field of developmental disabilities. Generally, behavioral approaches measure specific targeted behaviors. More recently, there has been a focus on measuring spontaneous interactions and generalization of skills, which presents new challenges in measurement. Also, developmental programs target underlying capacities, or ‘core deficits’ as the focus of intervention, with progress evident in a complex array of changes in interactive behavioral patterns.

Developmental approaches seek to measure changes in an individual’s capacity for:

- *Shared attention*
- *Ability to form warm intimate and trusting relationships*
- *The ability to initiate(rather than respond) using intentful actions and social engagement; spontaneous communication*
- *The ability to participate in reciprocal (two-way, mutual) interactions while in a range of different emotional states*
- *Problem solving through a process of co-regulation, reading, responding and adapting to the feelings of others*
- *Creativity*
- *Thinking logically about motivations and perspective of others*
- *Developing an internal personal set of values*

These developmental measures are more closely aligned to the diagnostic criteria for PDD/autism than the older ABA measures such as IQ, performance on early academic skills and responsive behaviors. The National Research Council stated in 2001: “More appropriate outcome measures are improvement in initiation of spontaneous communication in functional activities, and generalization of language across activities people, and settings”

Lord, Catherine; McGee, James (Editors). Committee on Educational Interventions for Children with Autism. *Educating Children with Autism*. Division of Behavioral and Social Sciences and Education, National Research Council. Washington, DC: National Academy Press (2001) p 217

An additional challenge confronting all researchers in the field is the wide diversity of individuals with a diagnosis of autism or a related disorder. Developmental models emphasize individual differences and the need to tailor intervention to the unique biological profile of the child and to the unique characteristics of the parent-child interaction.

Because both the factors being measured are complex and because of the wide range of individual differences in the population, research on the effectiveness of developmental framework has progressed looking at subcomponents of the overall approach. These can be summarized by looking at the three major aspects of the DIR®/FT approach: “D”- developmental framework, “I”- individual differences, and “R”-relationship and affective interactions.

“D” Developmental

A developmental approach is founded on work by major developmental theorists such as Piaget, Vygotsky, Erikson, and Kohlberg. A developmental approach considers behavior and learning in the greater context of a developmental or changing process. DIR®/FT was described by Dr. Greenspan and Serena Wieder in multiple scholarly publications, which received high honors and acclaim.

The Child with Special Needs: Encouraging Intellectual and Emotional Growth. By Stanley Greenspan, M.D. and Serena Wieder, Ph.D. (1997), Perseus Books

In 1997, evidence first showed the promise of the DIR®/FT approach: Charts of 200 children who were diagnosed with autistic spectrum disorder were reviewed. The goal of the review was to reveal patterns in presenting symptoms, underlying processing difficulties, early development and response to intervention in order to generate hypotheses for future studies. The chart review suggests that a number of children with autistic spectrum diagnoses are, with an appropriate intervention program, capable of empathy, affective reciprocity, creative thinking, and healthy peer relationships; that an intervention approach that focuses on individual differences, developmental level, and affective interaction may be especially promising;

Greenspan, S.I. and Wieder, S. (1997) Developmental patterns and outcomes in infants and children with disorders in relating and communicating: A chart review of 200 cases of children with autistic spectrum diagnoses. *Journal of Developmental and Learning Disorders* 1:87-141.

The DIR®/FT has provided a developmental framework that has been studied and found to be accurate and effective in understanding behavior. The widely used *Bayley Scales of Infant development* has adopted the DIR® milestones as the measure of social-emotional development through a process of careful standardization across populations.

The following research studies report the effectiveness of developmental approach:

Rogers, S. and D. Delalla. (1991). "A comparative study of the effects of a developmentally based instructional model on young children with autism and young children with other disorders of behavior and development." *Topics in Early Childhood Special Education* 11: 29-47.

Jocelyn, L., et al. (1998). Treatment of children with autism: a randomized controlled trial to evaluate a caregiver based intervention program in community day-care centers. *Developmental and Behavioral Pediatrics*, 19, 326-334.

National Research Council and Institute of Medicine (2000). *From Neurons to Neighborhoods: The Science of Early Childhood Development*. Jack P. Shonkoff and Deborah A. Phillips, eds. Board on Children, Youth, and Families, Commission on behavioral and Social Sciences and Education. Washington, DC: National Academy Press.

B. Hwang & C. Hughes (2000) "Increasing Early Social Communicative Skills of Preverbal Children with Autism through Social Interactive Training." *Journal of the Association for Persons with Severe Handicaps*, Vol 25, pp. 18-28.

Aldred, C., Green, J., Adams, C. (2004) A new social communication intervention for children with autism: pilot randomized controlled treatment study suggesting effectiveness, *Journal of Child Psychology & Psychiatry and Allied Disciplines*, 45(8): 1420-30

Vismara, Colombi, & Rogers. (2009). Can one hour per week of therapy lead to lasting changes in young children with autism? *Autism*, Vol 13 (1), 93-115

In 2007, Solomon reported a pilot study on the Play Project which showed significant increases in child subscale scores on the FEAS after a 8-12 month program using Floortime.

Solomon, R., J. Necheles, C. Ferch, and D. Bruckman. "Pilot study of a parent training program for young children with autism: The P.L.A.Y. Project Home Consultation program." *Autism* 11, no. 3 (2007) 205-224.

"I" Individual Difference

In the 1970s Jean Ayres pioneered discoveries about innate sensory processing differences.

Ayres JA. (1979). *Sensory Integration and the Child*. Western Psychological Services. Los Angeles, CA.

This provided a new way of understanding movement and regulatory behaviors. In addition this work showed that these biological differences could be influenced and changed by specific therapeutic interventions. Over the past 40 years, a huge body of research has further described not only biological differences in sensory-motor processing but further differences in emotional-regulatory processing.

The National Research Council of the National Academy of Sciences, in their 2001 landmark report, “Educating Children with Autism,” called for tailoring the treatment approach to the unique features of the individual child.

Lord, Catherine; McGee, James (Editors). Committee on Educational Interventions for Children with Autism. *Educating Children with Autism*. Division of Behavioral and Social Sciences and Education, National Research Council. Washington, DC: National Academy Press (2001) p 217

Developmental models, such as DIR® place great emphasis on tailoring intervention to individual differences, in alignment with the knowledge gained from this research.

“R” Relationship and Affect

Developmental models have evolved from many years of discovery in the field of infant mental health. Beginning in the 1950s, there was a new understanding of the importance of parent-infant interaction, known as attachment theory.

Bowlby, J. (1951). *Maternal care and mental health*. World Health Organization (WHO). Monograph Series, no. 51. Geneva: World Health Organization.

Ainsworth, M., Bell, S.M., & Stayton, D. (1974). Infant-mother attachment and social development: Socialization as a product of reciprocal responsiveness to signals. In M. Richards, ed., *The Integration of the child into a social world*. Cambridge: Cambridge University Press.

Stern, D. (1974). Mother and infant at play: The dyadic interaction involving facial, vocal, and gaze behaviors. In M. Lewis and L. Rosenblum, eds., *The effect of the infant on its caregiver*. New York: John Wiley & Sons, Inc.

Dr. Greenspan and Serena Wieder began their work with the study of the importance of mother-child interactions in high risk infants.

National Center for Clinical Infant Programs (1987). *Infants in Multirisk Families. Case Studies in Preventive Intervention*. Stanley I. Greenspan, Serena Wieder, Robert A. Nover, Alicia Lieberman, Reginald S. Lourie, Mary E. Robinson, eds. Clinical infant Reports, Number three. International Universities Press.

There have been years of research confirming the importance of parent-child interaction and the value of intervention programs focused on supporting parent-child relationships. This work has become highly sophisticated in research methodologies examining joint attention and emotional attunement.

Mundi, P., Sigman M., Kasari C. (1990). A longitudinal study of joint attention and language development in autistic children. *Journal of Autism and developmental Disorders* 20:115-128.

Alan Fogel (1993), *Developing Through Relationships*, The University of Chicago Press. Synopsis available at <http://www.press.uchicago.edu/presssite/metadata.epl?mode=synopsis&bookkey=52786>

Board on Children, Youth, and Families, *From Neurons to Neighborhoods: The Science of Early Childhood Development*, Jack B. Shonkoff and Deborah A. Phillips (Eds.), National Academies Press, Washington, DC, 2000, pdf version at www.nap.edu/catalog.php?record_id=9824

Affleck, G., et al. (2001). Promise of relationship-focused early intervention in developmental disabilities. *Journal of Special Education*, 16, 413-430.

Mahoney, G. & Perales, F. (2003). Using relationship-focused intervention to enhance the social-emotional functioning of young children with autism spectrum disorders. *Topics in Early Childhood Special Education, 23*, 74-86.

Mahoney, G., and F. Perales. "Relationship-focused early intervention with children with pervasive developmental disorders and other disabilities: a comparative study." *Journal of Developmental & Behavioral Pediatrics 26*, (2004): 77-85.

Kim, J. and Mahoney, G. (2005). The effects of relationship focused intervention on Korean parents and their young children with disabilities. *Research in Developmental Disabilities, 26*, 117-130.

Gernsbacher has shown that intervention can change the way parents interact to increase reciprocity and that these changes are correlated with changes in social engagement and in language.

Gernsbacher M.A., (2006). Toward a behavior of reciprocity. *Journal of Developmental Processes, 1*, 139-152. http://psych.wisc.edu/lang/pdf/gernsbacher_reciprocity.pdf

Kasari et al. 2008 used a randomized, controlled trial looking at joint attention and symbolic play in 58 children with autism. Results indicate that expressive language gains were greater for treatment groups which used developmental approaches compared with the control group that was based only on behavioral principles.

Kasari, Connie; Paparella, Tanya; Freeman, Stephanny; Jahromi, Laudan B. "Language outcome in autism: Randomized comparison of joint attention and play interventions." *Journal of Consulting and Clinical Psychology*. Vol 76(1), Feb 2008, 125-137.

Integration of D-I-R®

In addition to the three major areas of investigation, there is concurrently a body of research accumulating about ways to understand complex systems. Generally termed "dynamic system models" this is directly relevant to the analysis of developmental approaches, which are directed towards underlying developmental capacities. Autism is now recognized as a disorder of integration of various distinct brain functions. Research investigation is focused on deficits in neuronal communication as a basis of the wide array of behavioral manifestations of the disorder. Developmental intervention is based upon the use of affect to enhance integration of sensory-regulatory, communication and motor systems.

Research evidence is therefore derived not only from the subcomponents of development capacities, but also in the global view of affect based integrative function. Neuro-imaging research is beginning to provide important ways of showing how experience affects developing brains. Siegel has shown how attuned relationships in infancy change brain structure in ways that later affect social and emotional development.

Siegel, D. (2001). Toward an interpersonal neurobiology of the developing mind: attachment relationships, "mindsight," and neural integration. *Infant Mental Health Journal, 22*, 67-94.

A current research study by Casenhiser, Stieben and Shanker at the Milton and Ethel Harris Research Institute is investigating behavioral and neurophysiological outcomes of intensive DIR®, using both ERP and EEG measurements.

Claims and Current Research

Behavioral approaches, specifically ABA have made sweeping claims about their effectiveness. In 2001, The National Academy of Sciences report concluded that there is some evidence for both developmental approaches and behavioral approaches but no definitive evidence for either. There have been no comparative studies between these two approaches.

Lord, Catherine; McGee, James (Editors). Committee on Educational Interventions for Children with Autism. *Educating Children with Autism*. Division of Behavioral and Social Sciences and Education, National Research Council. Washington, DC: National Academy Press (2001)

Two systematic reviews published in 2009 reaffirm the academy's findings. The authors of one systematic review state, "There is no clear answer regarding the most effective therapy to improve symptoms associated with ASD [Autism Spectrum Disorders]." ¹

Ospina, M., Krebs Seida, J., Clark, B., Karkhaneh, M., Hartling, L., Tjosvold, L., Vandermeer, B., Smith, V. (2008) Behavioural and Developmental Interventions for Autism Spectrum Disorder: A Clinical Systematic Review, *PLoS ONE* 3(11): e3755. doi:10.1371/journal.pone.0003755.

The second metaanalysis concluded that, "Current evidence does not support ABI [Applied Behavior Intervention] as a superior intervention for children with ASD."

Spreckley, M., Boyd, R. (2009) Efficacy of Applied Behavioral Intervention in Preschool Children with Autism for Improving Cognitive, Language, and Adaptive Behavior: A Systematic Review and Meta-analysis. *The Journal of Pediatrics*, 154(3): 338-344.

Because of the challenges in identifying uniform treatment groups, isolating treatments, ensuring fidelity of treatment approaches, and the lack of validated measurement tools, many authors have stated that it is too soon for meaningful randomized clinical trials.

Costa G & Witten MR (August 2009). Pervasive Developmental Disorders. In Mowder, Rubinson & Yasik (Eds), *Evidence-Based Practice in Infant and Early Childhood Psychology*. Wiley.

Michelle Garcia Winner, *A Politically Incorrect Look at Evidence-based Practices and Teaching Social Skills* (2008)

S. J. Rogers & L.A. Vismara (2008), "Evidence-based Comprehensive Treatments for Early Autism," *Journal of Clinical Child and Adolescent Psychology*, p 37, pp 8-38

Drew 2002, and Mahoney 2003 have suggested that other methodology be considered in lieu of randomized controlled trials, such as norm referenced scores, and logic models.

Drew, A., et al. (2002). A pilot randomized control trial of a parent training intervention for preschool children with autism: preliminary findings and methodological challenges. *European Child & Adolescent Psychiatry*, 11, 266-272.

Mahoney, G. and Perales, F. (2003). Using relationship-focused intervention to enhance the social-emotional functioning of young children with autism spectrum disorders. *Topics in Early Childhood Special Education*, 23.

Dr. Doreen Granpeesheh, who serves as a First Vice Chair of the Autism Society of America, has written extensively on ABA. She runs a large company devoted to ABA called the Center for Autism and Related Disorders (CARD), and co-wrote an article on the future of ABA, stating: “*Increasingly, researchers have been suggesting that the idea that there is a best treatment for autism is counterproductive and misleading....The remarkable heterogeneity displayed by people with autism calls into question the idea that randomized clinical trials (RCTs) should, at the time of the development of the field, be considered the gold standard for evaluation whether a specific treatment has merit.*”

Carr, E., Granpeesheh, D., Grossman, L. The Future of Applied Behavior Analysis in Autism Spectrum Disorder. *Autism Advocate* 2008; 4:50-58.

Historically, behavioral approaches have not focused on relationships or individual differences. Pivotal Response Training or PRT a form of naturalistic behavioral treatment is a more recent form of behavioral intervention that is based on following the child’s interest to increase motivation.

Koegel, R., Koegel, L., and McNeerney, E. (2001). Pivotal areas in intervention for autism. *Journal of Clinical Child Psychology*, 30, 19-32.

Dr. Laura Schreibman, principle investigator at the UCSD Autism Research Program, and a proponent of PRT, reports that Floortime and PRT share similarities in their execution to such an extent that despite the differences in underlying rationale she believes that Floortime might do well in empirical validation.

The Science and Fiction of Autism Harvard University Press 2005 pp 172 - 177 section called. "Treatments Likely to Be Effective".

Now in 2009, the Bridge Collaborative, a group comprised of UCSD, Rady Children's Hospital the San Diego Regional Center, The Harbor Regional Center (Torrance, Long Beach), Kaiser Permanente, parents, and private providers, and others, was awarded a \$300,000 NIH R01 grant for a pilot study, with a clear path toward a \$5,000,000 grant, to implement evidenced based screening and intervention in Southern California. Three evidence based models will be started this fall, including DIR®/Floortime (Solomon - Play Project).

Clinically observed Evidence

While research efforts continue to understand the etiology, pathophysiology, and efficacy of treatment approaches for autism, clinical experience also continues to accumulate. DIR®/Floortime programs have high family satisfaction ratings and are widely utilized as an effective modality. It is recognized by the American Academy of Pediatrics as one of two approaches for the treatment of autism.

Technical Report: The Pediatrician’s Role in the Diagnosis and Management of Autistic Spectrum Disorder in Children <http://pediatrics.aappublications.org/cgi/reprint/107/5/e85> on page 9

Easter Seals funds in home programs, using Floortime, in many sites across the country, including central CA, Fresno County.

www.easterseals.com/site/PageServer?pagename=ntlc8_autism_service_preschool
http://centralcal.easterseals.com/site/PageServer?pagename=CACN_PS_playproject

Autism Speaks refers to DIR®/Floortime

<http://www.autismspeaks.org/whattodo/index.php>

The Center for Disease Control also lists DIR/Floortime as a major treatment approach.

www.cdc.gov/ncbddd/autism/treatment.htm

The Institute for Children with Developmental and Learning disorders (ICDL) provides a training program for clinicians and teachers to become certified in using DIR®/FT. The certification process requires several years of training, and is designed for licensed or certificated clinicians and teachers. Floortime can also be done by parents, caregivers, and non-certified professionals, under the guidance of a specialist for a particular child. It is utilized in over 85 countries around the world.

In California, DIR®/FT programs currently receive funding through many regional centers including those in San Diego, Orange County, greater Los Angeles area, Santa Barbara, San Francisco and the Bay area.

Conclusion

Efforts continue to understand the complex disorder of autism. We are all aware of the alarming increase in incidence, and the lack of specific information about etiology. Fortunately there is a growing understanding of individual differences, the importance of relationship based intervention, and the capacity of children to improve.

Greenspan, S.I. and Wieder, S. (2005) Can Children with Autism Master the Core Deficits and Become Empathetic, Creative and Reflective? A Ten to Fifteen Year Follow-up of a Subgroup of Children with Autism Spectrum Disorders (ASD) Who Received a Comprehensive Developmental, Individual-Difference, Relationship-Based (DIR) Approach. *The Journal of Developmental and Learning Disorders* 9.

The most recent edition of *Zero to Three* (September 2009) is focused on “The Importance of Play.” This further supports the role of spontaneous, child led social play experiences, to support social-emotional and cognitive development. While research continues, it is imperative the developmental approaches remain a viable option for intervention for children with developmental disorders and their families.

A review by the National Institute of Mental Health (NIMH) states, “There is no single best treatment package for all children with ASD. Decisions about the best treatment, or combination of treatments, should be made by the parents with the assistance of a trusted expert diagnostic team.”

NIMH. (June 2, 2009). *Autism Spectrum Disorders (Pervasive Developmental Disorders)*. Retrieved June 8, 2009, from <http://www.nimh.nih.gov/health/topics/autism-spectrum-disorders-pervasive-developmental-disorders/index.shtml>

The DIR®/Floortime approach is a widely accepted and respected developmental approach for individuals with disorders of relating and communicating. It is based upon solid research, and is the basis for current active investigation as the field advances. It is in ‘general physician practice’ as indicated by its reference in the most recent American Academy of Pediatrics “Toolkit for Autism.”

Trailer bill language: Regional centers are prohibited “from purchasing experimental treatments, therapeutic services or devices that have not been clinically determined or scientifically proven to be effective or safe or for which risks and complications are unknown.” “Experimental treatments of therapeutic services include experimental medical or nutritional therapy when the use of the product for that purpose is not a general physician practice.”

It would be an error to consider the leading developmental approach as “experimental” when it is in fact a highly effective approach which benefits many children and families.