

## **DIR®/Floortime™: Evidence based practice towards the treatment of autism and sensory processing disorder in children and adolescents**

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**Abstract:** Interventions for children/adolescents with developmental delays such as autism have often been limited to behavioral approaches that focus on the successful completion of a task rather than in the joyous reciprocal interaction of individuals relating to one and another. DIR/Floortime (Developmental, Individual Difference, Relationship-based) offers an alternative perspective to therapy that takes into account an individual's intrinsic level of interest and then expands on that initial level of motivation to incorporate mutual interest of others, all the while supporting various neurological differences that may be impeding the actual level of development in the first place. The result is a reciprocal interaction that results in an overall improvement in actual brain development processing. This article offers an overview of the theoretical, conceptual, and practical approach to the assessment, diagnosis and treatment of children/adolescents with developmental delays such as autism through the developmental relationship intervention known as DIR/Floortime. Adaptation of play techniques will be examined for use with those impacted, in individual, and family therapy contexts as the primary area of focus.

**Keywords:** DIR®/Floortime™, developmental capacities, Individual neurological differences, relationship- based affective interactions

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### **Introduction**

Play is a complex phenomenon that occurs naturally for most children; they move through the various stages of play development and are able to add complexity, imagination, and creativity to their thought processes and action. However, for many children with autism spectrum disorder (ASD), the various stages of play are difficult to achieve. Challenges in motor planning, expressive and receptive communication, imitation and fine and gross motor movements are just some of the many obstacles that children with ASD encounter during play (1). The Developmental, Individual Difference, Relationship-based model

(DIR®)Floortime model is an interdisciplinary framework that enables play clinicians, parents and educators the ability to construct a holistic assessment and intervention program that comprehensively incorporates the child's and family's unique developmental profile that addresses these core deficits (2).

Floortime™ is the heart of the DIR® Floortime™ model and it is the play component of a comprehensive program for infants, children, adolescents and their families with a variety of developmental challenges including autism spectrum disorders. This comprehensive program includes working on all elements of the DIR® Floortime™ model, the functional emotional developmental levels and the underlying, individual, neurological differences in processing capacities, thus creating those learning relationships that will help the child move ahead in their development. These relationships in turn are tailored to the child's individual differences that move them up the developmental ladder, mastering each and every functional emotional developmental capacity that they are capable of (3). The DIR® Floortime™ model involves often not just Floortime™, but different therapies like speech and language therapy, occupational therapy, physical therapy, educational programs, counseling support for parents, and home programs as well as school programs. For the purposes of this article though, I will focus on the Floortime™ component, which is the heart of both the home and the school component. This paper includes a summary of evidence based research that lends support to this developmental/relational based play intervention for children impacted by autism and their families.

### **The DIR floortime model**

Floortime™ is a particular technique where the play partner gets down on the floor and works with the child to master each of their developmental capacities. But to represent this model fairly, you will need to think about Floortime™ in two ways (4):

- A specific technique where for 20 or more minutes at a time a parent gets down on the floor to play with their child.
- A general philosophy that characterizes all of the interactions with the child. All of the interactions have to incorporate the features of Floortime™ as well as the particular goals of that interaction including understanding the child's emotional, social and intellectual differences in motor, sensory, and language functioning, and the existing caregiver, child and family functioning and interaction patterns.

At the heart of the definition of Floortime™ are two of what could be called emphases that sometimes work together very easily and other times may appear to be at opposite ends of a continuum:

- Following the child's lead.
- Joining a child in his world and then pulling them into a shared world to help them master each of his functional emotional developmental capacities (2).

It is critical to be aware of both of these polarities, tendencies or dimensions of Floortime™.

## **Following the child's lead**

The most widely known dimension of Floortime™ is following the child's lead—in other words, harnessing the child's natural interests. But what exactly does that mean? By following a child's interests, or their lead, we are taking the first steps in making what I call a great date with a child, in other words a validating emotional experience. What are the elements of a great date? For most of us, it includes being in the company of someone who is attentive, available, fun. And when we are with a person who incorporates all of these emotionally affirming elements, we obviously want the date to go on forever. Conversely, if we are on a bad date, with someone who does not make us feel good about ourselves or our experience, most of us would attempt to escape that encounter as soon as possible. Following a child's lead, taking the germ of their idea and making that the basis of the experience that you are about to share with the child, actually encourages the child to allow you into their emotional life. Through the child's interests; through the child's natural desires, we get a picture of what is enjoyable for the child. Consequently the child stays regulated and engaged longer is able to learn within the experience and ultimately moves forward developmentally (5).

## **Case example**

A child appears not to be able to leave their home without holding onto a stick. This seems like something inappropriate and something we might want to discourage. But yet something about this object has meaning for this child. So we first have to start off asking ourselves, what is it about this activity that is so meaningful for the child? It is minimizing to simply attribute what we assume to be aberrant behavior to the fact that a child has a developmental delay like autism. Not only is this short sighted, but it does little to help us understand the underlying causes that are potentially fueling the odd behavior. The key to understanding the child is to follow their lead as an entry point into their world, create an emotional connection, a relationship that allows us to pull that child into a shared emotional experience. This might mean that the adult facilitator picks up his own stick and attempts to mimic the gestures of the original item. Then it is up to the adult to expand the initial gesture into something socially appropriate and mutual, say taking the two sticks and gently pretending to fence with them and/or helping the child with developmental delays enter the world of symbolism by pretending that the stick is actually the body of an airplane, the play facilitator guiding by making the appropriate sounds and gestures of a gliding plane.

Here the two philosophies behind DIR® Floortime™ are at work. We are accepting the child and their beloved object knowing that there is something intrinsically valuable in the relationship that that child has with the object and we are also encouraging a child to leave their preferred world of isolation in favor of an experience where his original idea of holding onto a stick has magically emerged into a shared play experience.

## **Joining the child's world**

Following the child's lead is only one half of the equation; one half of this dynamic that we call Floortime™. There is another half; joining the child in their world and pulling them into a shared emotional experience in order to help them master each of their Functional Emotional Developmental Capacities. These are

the fundamentals of emotional, social, language and intellectual development. When we talk about Functional Emotional Capacities, we're talking about the fundamentals of relating, communicating and thinking (3).

The larger goal is joining the child in their world. We want to then pull them into our shared world to teach them and help them learn how to focus and attend, how to relate with real warmth, how to be purposeful and take initiative, and have a back-and-forth set of communications with us through non-verbal gestures, and eventually through words. We want to teach them how to problem solve and sequence and get them involved in a continuing interaction with the environment and the people in their environment. We want to teach them to use ideas creatively and then we want to teach them to use ideas logically and then progress up the developmental ladder until they are not only using ideas logically but actually showing high degrees of reflective thinking and high degrees of empathy and high degrees of understanding the world so that they can evaluate their own thoughts and feelings. Not every child is capable of achieving the highest level of reflective thinking, but almost all children are capable of moving up the developmental ladder, mastering their own Functional Emotional Developmental Capacities in regards to optimum social, emotional, and intellectual, linguistic and academic growth (6). Some concerns expressed by play clinicians is whether or not DIR® Floortime™ is applicable to children who have moderate to severe forms of developmental delays. The direct answer is yes, even with children who are severely impacted with developmental delays, with the right kind of support, you can move that child forward and upward.

### **Case example**

Jane is five years old chronologically, although her current developmental age is about 6 months old. She has no functional language and does not appear to have the interest or the capacity to play with toys. In addition to the diagnosis of severe autism, the child also has a co-morbid diagnosis of moderate to severe mental retardation. She enters the playroom mostly aimless, not able to stay engaged with anything or any person for any length of time. Characteristic of the disorder, the child flaps her arms in a self-stimulatory gesture in a continuous horizontal pattern.

The difficulty that play clinicians often face with severely impacted children is the confusion of how to follow a child's lead when the child appears to not be able to offer any lead to follow. This is the art of Floortime™. You cannot do Floortime™, the play therapy portion of this intervention, unless you understand the child's DIR® (the developmental capacity, the underlying, neurological, processing differences and how to use the child's relationship in the world to woo that child into a shared experience). By knowing a child's DIR®, the interventionist knows how and where to enter the child's world in such a way as to create a validating experience- in other words, the great date. To move a child forward developmentally, to become a more complex thinker, despite overt cognitive delays, we need to make sure they possess the basic capacity to be regulated and stay engaged.

Since Jane is only offering her hand movements as "the lead", this is where the clinician must enter. Playfully, the therapist puts her own hands within the child's self stimulatory hand and arm movements. Notice, that the clinician is not entering the play encounter thinking that she is with a 5 year old child; rather

the therapist joins Jane at the little girl's developmental capacity. In other words, in the clinician's mind, she is now playing with a child who is 6 months old and must drop her intervention and her level of expectation to that level, while she uses her relationship to support the child's underlying processing challenges. Consequently, the therapist slows the child's flapping gesture down, creating a regular opening and closing rhythm to what was a moment before, a chaotic gesture. As the interventionist slows and regulates to the beat of the activity, the clinician also uses her voice and her facial gestures to create a high affective encounter. The clinician begins to sing a classic child's song, "Open shut them, open shut them, give a little clap". Suddenly, Jane, who up until this time appeared not to be able to focus and attend, looks with curiosity into the face of her play partner. She appears intrigued and curious. The clinician has just taught this child the first fundamental game of play, pat-a-cake. The developmental age of this child and subsequently her ability to be a more complex thinker, has improved within one play session from 6 months of age to 9 months of age.

### **Progressing from following a child's lead to mastery**

How do we use "following the child's lead" to actually mobilize and help the child master these critical developmental milestones? To help children master the first stage of shared attention, when they are, for example, wandering away from our interaction with them, we may play a game that places the play partner in front of the child essentially blocking the child's exit from the interaction. The blocking gesture necessitates the child creating some kind of engagement with their play partner, even if it's a gesture of annoyance. This will form the foundation of the first act of shared attention that they are providing. The play partner is encouraged to continue to up the ante by creating more playful obstructions (like asking for a ticket or a token from the child to assure passage). These types of maneuvers create multiple opportunities for shared attention as well as sustained engagement, because the child is otherwise involved with the therapist. Interestingly, this is also the beginning of purposeful action because the child is trying to move the obstruction (in this case the therapist) out of the way. As they continue to attempt to maneuver the obstacle out of the way, the therapist "plays dumb," forcing the children to solve their way out of the current obstacle. These strategies are called playfully obstructive strategies and they are for the most aimless of children or the most avoidant child.

### **Case example**

A 5-year-old boy named Ian, impacted with a moderate degree of autism, enters the play room and appears to absent mindedly pick up a piece of chalk, before dropping the drawing material randomly on the floor. Previously, his mother has expressed concern that her son is not showing any age-appropriate interest in drawing, coloring, or cutting, and she fears that the child is progressively falling further and further behind his classmates. The clinician, keeping in mind the parent's concern, decides to take the play activity out of the playroom and into an outdoor play area. She follows Ian's lead by attempting to incorporate the child's fleeting interest in the chalk and then attempting to expand that germ of an idea into a sustained play encounter by doing some chalk drawing on the sidewalk. Once outside, she places Ian in her lap, both to prevent flight and also to help the child become more regulated and engaged by providing proprioceptive input

(deep pressure) around which he can organize and reduce the anxiety that is potentially fueling his resistance to the play activity. She hands the child a piece of chalk, while mimicking hand- over -hand gestures in its use. Ian completely rejects the activity and withdraws his hand from any attempt to handle the chalk.

One of the basic principles of Floortime™ is “never take no for an answer.” In other words, try not to back away from the resistance that is going to be presented when you try to initially move a child forward developmentally. The first step in this case, is to clarifying the child’s actual capacities to see if he has the physical ability to hold a piece of chalk in his hand. Using occupational therapy strategies, the therapist explores whether or not the child has an adequate pincher grasp (the ability to pinch together the thumb and the forefinger) by seeing if the child is capable of handing the clinician’s therapy dog a dog biscuit. The thinking is that the child’s resistance to drawing can be overcome by his greater love for the clinician’s dog. Ian is readily able to feed the dog with the appropriate grasp. This encourages the clinician to further expand the interaction by having the child draw the letters of the dog’s name in chalk and then having him use his pincher grasp to again dot the letters of the dog’s name with muffin (left over from a previous social skills baking activity) while instructing the dog to “eat up her name” on command. This time around, the request to draw with the chalk is met with absolutely no resistance as Ian delights in the use of this “living puppet” to playfully overcome his resistance to the task and ultimately move him forward developmentally.

The goal of playfully obstructive strategies is to follow the child’s lead on the one hand but then create opportunities and challenges that help the child master each of his functional emotional developmental goals on the other. That is the dialectic, the two opposite polarities of Floortime™: joining the child in his rhythms while creating systematic challenges that creates opportunities to master new developmental milestones. It is in those systematic challenges that many of the specific techniques and strategies of Floortime™ come into play.

In conclusion, DIR® Floortime™ requires clinicians, and the parent or caregiver whom they are training to appreciate the polarity between following the child’s lead and entering their world. Only then can children be “pulled” into a shared world, by finding their pleasure and joys while continually challenging them to master each of the functional developmental capacities. That means paying attention to the child’s underlying neurological differences in the way that they processes sound and sights and movements and modulates sensations. It also means paying attention to the family patterns and to your own reactions as play clinician. This encourages both self awareness and improved techniques as one enters a child’s world and tailors interactions to the child’s specific nervous system.

### **Evidence base for the DIR® Floortime™ approach**

Evidence-base practice integrates the best available scientifically rigorous research, clinical expertise, and the therapist’s characteristics to ensure the quality of clinical judgments and delivery of the most cost-effective care (7). A starting point to measure effectiveness of intervention is to determine the factors to be measured. Developmental programs like DIR® Floortime™, in contrast to behavioral approaches that tend to measure specific targeted behaviors, 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 capacities seek to measure changes in an individual's capacity for shared attention, the ability to form warm intimate and have trusting relationships and the ability to initiate using intentioned actions and social engagement that leads to spontaneous communication. Additionally, developmental capacities look at problem-solving strategies by assessing the ability to have co-regulation and consequently being able to adapt to the feelings of others. Developmental capacities also determines individual's ability to be creative as well as the capacity to have logical and analytic thought while developing a sense of self or core values (8).

Developmental models emphasize individual processing differences and the need to tailor intervention to the unique biological profile of children as well as the characteristics of the relationship between parent and child. Because both the factors being measured are complex and because the wide range of individual neurological processes in the population, research on the effectiveness of a developmental framework has progressed by examining the subcomponents of the overall approach. The subcomponents can be summarized by looking at the three major aspects of the DIR® Floortime™ approach:

- D for developmental framework
- I for the underlying, neurological, processing differences of a child
- R for relationship and subsequent affective interactions

## **D: The developmental framework**

A developmental approach considers behavior and learning in the greater context of a developmental or changing process. In 1997, evidence first showed the promise of the DIR® Floortime™ approach when 200 charts of children who were initially 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 suggested that a number of children with autistic spectrum diagnoses were, with appropriate intervention, capable of empathy, affective reciprocity, creative thinking, and healthy peer relationships (2). The results of the 200 case series led Greenspan and Wieder to publish in 2000 the full description of the DIR® Floortime™ Model (4,9). In 2005, Greenspan and Wieder published a 10-to 15-year follow up study of 16 children diagnosed with ASD that were part of the first 200 case series. The authors described that 10 to 15 years after receiving DIR® Floortime™ as a treatment method, these children had become significantly more empathetic, creative and reflective adolescents with healthy peer relationships and solid academic skills (10).

The DIR® Floortime™ Model has provided a developmental framework that has been studied and found to be accurate in understanding behavior. A common pediatric assessment tool, The Bayley Scale of Infant Development, has adopted the DIR® milestones, specifically configured as the Greenspan Social-Emotional Growth Chart (SEGC) as the measure by which social and emotional development is measured (9Greenspan, 2004). In 2007, Solomon et al., published an evaluation of the Play Project Home Consultation (PPHC), an in-home based version of the DIR® Floortime™ model that trains parents of children with

autism spectrum disorder in the DIR® Floortime™ model. The results showed significant increase in the child subscale scored on another pediatric assessment tool the Functional Emotional Assessment Scale (11) after an 8- to 12-month program using DIR® Floortime™ (12).

### **I: Individual underlying neurological processing differences**

In 1979, occupational therapist Jean Ayres, pioneered discoveries about the way in which a child's sensory processing capacities could impact the way in which children learned and integrated themselves into their worlds (13). This revolutionary idea provided a new way to understand the importance of movement and regulatory behaviors in children and began to offer explanations for some of the more worrisome behaviors impacting children with developmental concerns like autism. Over the last 40 years, a large body of research has further illuminated the impact of biologically based differences in regards to both sensorimotor processing and the impact on emotional regulation. In 2001, the National Research Council of the National Academy of Sciences, published a report entitled "Educating Children with Autism" which called for the tailoring of treatment approaches to fit the unique biological profile of the individual child (14). Lillas and Turnball (15), in their published text, described how all behavior is influenced by the sensory systems in the brain. They indicated that an infant's sensory capacities are genetically prepared to respond to human interaction and are shifting in direct relationship to the parent's touch, facial, vocal and movement expressions. Child-parent interactions and sensory activities create nerve cell networks and neural pathways in the development of the child's brain. The exchange of that takes place during child-parent play interactions are seen as an ongoing loop of sensorimotor transformations (15).

### **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-child interaction (16). Building on these years of research in developmental psychology that underscores the importance of early relationships and family functioning, Dr. Stanley Greenspan and his partner, Dr. Serena Wieder, began their work together studying the interaction of mothers and their babies in the context of infants who were at high risk for attachment problems (17). Subsequently, there have been numerous research studies confirming the importance of parent-child interaction and the value of intervention programs that focus on supporting the parent-child relationship, particularly in the areas of joint attention and emotional attunement (18). In 2006, Gernsbacher published a paper that showed how intervention itself between a parent and child could change the way in which parents interact, in turn increasing reciprocity, and that these changes correlated to positive changes in social engagement and language. And in 2008, Connie Kasari and colleagues at the University of California-Los Angeles (19) used a randomized controlled trial to look at joint attention and symbolic play with 58 children with autism. Results indicated that expressive language gains were greater for treatment groups where a developmental model was utilized as compared with a control group that was based on exclusive behavioral principles.

## **Discussion**

Autism is now recognized as a disorder of integration among various distinct brain functions. Research investigation is currently focused on understanding deficits in neuronal communication as a basis of the wide array of behavioral manifestations of the disorder (8). Developmental intervention has advanced to incorporate the use of affect to enhance integration of sensory-regulatory, communication and motor systems. With that in mind, neuro-imaging research is beginning to provide a deeper understanding as to how emotional experiences are actually impacting developing brain growth. Siegel (20) showed how attuned relationships in infancy change brain structure in ways that later impact social and emotional development, and recently, a research study by Casenhiser, Stieben and Shanker (21) at the York University in Canada, investigated the behavioral and neuro-physiological outcomes of intensive DIR® Floortime™ intervention, using both event-related potential (ERP) and electroencephalography (EEG) measurements. Discussion is also continuing on ways to apply the basic principles of DIR® Floortime™ towards an adult developmentally delayed population (22).

Efforts continue to deepen our understanding of the complexities of autism. The alarming increase in the diagnosis of autism worldwide (23), as well as the lack of specific information about etiology of the disorder demands that play therapists increase their knowledge and understanding of how a child's development is impacted by the individual, underlying, neurological processing differences and the interaction of the relationships that the child has in the world (10). In September 2009, Zero to Three focused an issue on the importance of play, specifically on the role of spontaneous, child-led, social play experiences that support social, emotional, and cognitive growth (24). Although research continues, it is imperative that developmental approaches like DIR® Floortime™ remain a viable option for intervention for children and adolescents with developmental delays and their families.

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