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## A Developmental Biopsychosocial Model

### *The Developmental, Individual-Differences, Relationship-Based (DIR) Approach*

**O**ur approach to assessment and treatment encompasses three dynamically related influences that work together to direct human development:

1. *The biological and genetic makeup that the infant brings into the world.* This includes relative strengths or weaknesses in auditory processing and language, visuospatial processing, motor planning and sequencing, and sensory and affective modulation. Children's processing capacities mediate the way they interact with those around them.
2. *The social environment, including family dynamics and cultural characteristics, in which the child resides.* Family, cultural, and other environmental factors help shape the thoughts, feelings, and behaviors that caregivers and others bring to their interactions with him or her.
3. *These interaction patterns with others are shaped by the child's biological and genetic makeup (1) and the child's social environment (2); these interaction patterns determine the extent to which the child masters or fails to master several of the six core developmental capacities.* The core developmental capacities include self-regulation, relating to others, preverbal two-way affective communication, and the use of symbols. Successful mastery of these capacities is reflected in adaptive emotional and behavioral functioning; lack of mastery or incomplete mastery results in developmental problems or symptoms.

As described in the Introduction, we call our approach to assessing and understanding the role of these factors in the development of infants and young children the *developmental, individual-differences, relationship-based (DIR) model*. In this model, **D** stands for the core developmental capacities the child needs to master; **I** refers to individual differences, which are the expression of the child's unique biology (genetic, constitutional, and maturational components); and **R** describes the child's relationship with caregivers, family members, and the larger culture.

The goal of assessment is to understand as much as possible about **D**, **I**, and **R**. This understanding sets the stage for intervention, in which the strategy is to tailor interactions with the child, including therapeutic interactions, to his or her individual processing differences (i.e., unique biology). The goal of intervention is to facilitate mastery of each of the core functional emotional developmental capacities (e.g., engagement, affect signaling, and symbol formation). Using this model, a clinician can help children and families deal with and overcome emotional and cognitive lags, constrictions, and deficits—as well as associated symptoms—and foster adaptive development.

## Functional Emotional Developmental Capacities

The infant or young child's functional emotional developmental level reveals how the child uses everyday functioning to integrate all capacities (social, motor, cognitive, language, spatial, and sensory) to carry out emotionally meaningful (i.e., functional) goals. Evidence for the existence of functional emotional developmental levels is reviewed elsewhere (Greenspan 1979, 1989, 1992, 1997, 2002; Greenspan et al. 2001; Wieder and Greenspan 2001). Functional capacities include the ability to

1. Attend to multisensory affective experience and, at the same time, attain a calm, regulated state (e.g., looking at, listening to, and following the movement of a caregiver).
2. Engage with and display preference and affection toward familiar caregivers (e.g., greeting mother, father, or regular babysitter with joyful smiles).
3. Initiate and respond to two-way presymbolic gestural communication (e.g., trading smiles and vocalizing back and forth with a parent).
4. Organize chains of two-way social problem-solving communications (i.e., open and close several "circles of communication" in a row), maintain communication across space, organize behaviors and affects into purposeful patterns, integrate affective polarities, and synthesize an emerging presymbolic sense of self and other (e.g., taking dad by the hand to get a toy on the shelf).
5. Create and use ideas as a basis for creative or imaginative thinking, giving meaning to symbols (e.g., engaging in pretend play, using words—"Juice!"—to meet needs).

6. Build bridges between two or more ideas. This ability is the basis for logic, reality testing, thinking, and judgment (e.g., engaging in debates, opinion-oriented conversations, or elaborate, planned pretend dramas).

This list reflects the child's progression through developmental stages or levels; each capacity builds on the ones previously attained. A child must first learn to attend and engage before he or she can exchange a series of coos and smiles with the mother. No stage is ever finished, however. The capacities already attained continue to be strengthened and refined. As children grow, they ideally learn to focus attention for longer periods. Their relationships continue to become more subtle and reciprocal. Emotional signaling becomes richer, deeper, and broader.

Each stage involves the simultaneous mastery of what are ordinarily thought of as emotional abilities and cognitive, or intellectual, abilities. A baby learns "causality" through the exchange of emotional signals (by smiling, she can make her parents smile back). This lesson is both emotional and cognitive. In fact, from the earliest moments of life, even our simplest physical experiences have an emotional valence. The sound of mother's voice is not a neutral auditory sensation but is experienced as soothing or aversive, depending on the mother's pitch and emotional tone and the infant's inborn sensitivity to sound. Father's touch is both a tactile sensation and a comforting, or overstimulating and upsetting, experience. At each developmental stage, new cognitive skills are learned from emotional interactions with caregivers.

We call the six core capacities "functional" for two reasons. First, they enable the child to interact with and comprehend his or her world. Second, they orchestrate many other capabilities. For example, as children learn to signal with emotions, in the first year of life, their emotions determine whether they will reach for something (i.e., use the motor system and muscles) and what kinds of vocalizations they will employ (one sound to indicate "I like that," another to say "I don't like that"). Emotions also lead them to search for and find the hidden toy in mommy's hand. Only a desirable toy will be searched for. Searching and finding develop the infant's perceptual-motor and visuospatial problem-solving skills. From early on, therefore, infants' emotions orchestrate the different parts of their minds, enabling the parts to work together in an integrated manner. We call the six core capacities "emotional" to highlight the role of emotions in organizing developmental processes.

## **Individual Differences in Sensory Modulation, Sensory Processing, and Motor Planning**

Biologically based individual differences are the result of genetic, prenatal, perinatal, and maturational variations. The following individual differences can be observed in infants and young children:

1. Sensory modulation, including under- and overreactivity to touch, sounds, sights, smells, tastes, and movements
2. Sensory processing, including auditory processing, language processing, and visuospatial processing. Processing includes the ability to register, decode, and comprehend sequences and abstract patterns.
3. Sensory-affective processing, or the ability to process and respond to affect. This includes the ability to link symbols and actions with emotions and intent. This processing capacity may be especially relevant for individuals with autism spectrum disorders (Greenspan and Wieder 1997, 1998).
4. Muscle tone
5. Motor planning and sequencing, or the ability to purposefully organize a sequence of actions or symbols, including symbols in the form of thoughts, words, visual images, and spatial concepts

## Relationships and Interactions

The family, community, and culture in which an infant is embedded will combine with her unique biologically based processing style to shape the kinds of human interactions she experiences. The interaction patterns between the child and her caregivers and family members bring the child's biology into the larger developmental progression. Developmentally appropriate interactions mobilize the child's intentions and affects. They broaden the child's range of experience at each level of development, helping the child move from one functional developmental level to the next. In contrast, interactions that ignore or fail to match the child's functional developmental level or individual differences can undermine progress. For example, a parent who is by nature aloof and taciturn may be unable to fully engage an infant who is by nature underreactive and self-absorbed. This child may not experience enough lively, warm interactions to develop the ability to focus attention and engage emotionally with others.

Understanding how biologically based processing differences and family/caregiver patterns influence each core functional emotional developmental capacity has allowed us to describe the developmental pathways that lead to mental health or to various disorders. This understanding has also helped us to discover methods of early identification and intervention that can help an infant return to an adaptive developmental pathway before problems become chronic. A recent study of more than 15,000 families by the federal government's National Center for Health Statistics showed that including items about functional emotional developmental capacities in a health survey led to the identification of approximately 30% more infants at risk than were identified by earlier surveys that asked only about developmental or emotional problems. Most of these children were not receiving intervention services (Simpson et al. 2003).

## **Assessment and Treatment Planning Using the DIR Model**

An assessment encompassing all aspects of the DIR model requires several sessions with the child and family. It also includes a biomedical evaluation and consultation with other professionals, such as speech pathologists, occupational and physical therapists, teachers, and mental health colleagues. The assessment leads to construction of a functional emotional developmental profile describing the child's six functional emotional developmental capacities (as well as three additional, more advanced capacities, which we describe in Chapter 3, "Assessment"); his or her biologically based processing differences; and the patterns of interaction available to the child at home, in school, with peers, and in other settings.

The profile serves as a basis for determining the specific kinds of experiences the child and his or her family need in order for the child to acquire missing developmental capacities or strengthen underdeveloped ones. The profile thus guides the clinician in creating interventions tailored to the individual child, as opposed to the all-too-common practice of placing children into existing intervention programs based on broad, nonspecific diagnostic criteria. Treatment planning addresses all elements of the DIR model: developmental competencies, individual processing differences, and relationships with family, teachers, peers, and others who play important roles in the child's life.

The functional approach enables the evaluating clinician to consider each of the child's functional challenges separately, explore different possible explanations for them, and resist the temptation to assume prematurely that difficulties are tied together as part of a syndrome. For example, hand flapping is exhibited by children with a variety of motor problems when they become excited or overstimulated. Many conditions, including cerebral palsy, autism, hypotonia, and dyspraxia involve motor problems and, at times, hand flapping. Yet this symptom is often assumed to be uniquely a part of autism. Over time, the functional approach to assessment may help clarify which symptoms are truly unique to particular syndromes, leading to new classifications.

The DIR model emphasizes early, presymbolic levels of functioning. It is in the early developmental stages—associated with the first four functional emotional capacities—that the basic structures of personality are being built. A person's ability or inability to test reality, interact socially, form relationships, control behavior, regulate moods, integrate emotional polarities such as love and anger, and form a sense of self that is cohesive rather than fragmented all have roots in this period of life. A child's personality organization can be thought of as the stage on which his or her current drama—relationships, concerns, wishes, fantasies, feelings—unfolds. An accurate picture of the construction and contours of this stage is essential if we are to fully understand the drama.

The assessment and treatment planning process and the contents of the functional emotional developmental profile are described in detail in Chapter 3, "Assessment."

## **A Developmental Biopsychosocial Approach**

As we have described, the DIR approach attempts to understand the developmental steps or organizations leading to mental health and mental illness. It takes into account biology as well as the experiences of the individual. Not only do biology and experience interact, but at each stage of development they interact in different ways. Between the biologically based characteristics a baby might inherit and his or her behavior as an adult lie many intermediary developmental levels of organization, each of which builds competencies, vulnerabilities, or full-blown disorders.

This building process is especially complex because biology and experience interact bidirectionally. At each developmental stage, experience can alter not only behavior but also the underlying biology of the organism. Learning experiences, for example, change the physical structure of the synapses used by the brain when it converts experience into long-term memory. Extra experiences with one sensory pathway or another increase the neuronal connections in that pathway. In the other direction, certain physical characteristics of the organism tend to invite certain types of experiences. A "floppy" baby with low muscle tone who is underreactive to sound and touch will be somewhat unresponsive, and many parents will respond to the baby's unresponsiveness with a lack of involvement, making the baby even more withdrawn. If we change the direction of this process once again, and the caregiver woos the underreactive baby into especially pleasurable nurturing interactions by being highly energetic and persistent, this same baby becomes outgoing, assertive, curious, and delightful. In our clinical work, we have observed differences in social, language, and cognitive outcomes for such children, depending on how the caregiving environment responds to their inborn characteristics.

Neither biology nor experience, then, is destiny. The baby with low muscle tone can successfully or unsuccessfully negotiate his early capacity for forming relationships. This step will then form the foundation for either intimacy and trust or self-absorption and, perhaps, suspiciousness. The toddler with an inborn tendency to be emotionally labile can experience further and more dramatic mood swings if his caregiver is habitually too intrusive or too withdrawn. With caregivers who can sensitively "upregulate" and "downregulate" their emotional interactions with the child, he will gradually internalize the ability to regulate his own moods.

As we can see from these examples, a baby's biological and genetic makeup does not act directly on her behavior or intrapsychic experience; rather, it influences the ways in which the baby is able to interact with others. Relative strengths or weaknesses in such areas as auditory and language processing, visuospatial pro-

cessing, and sensory and affective modulation will play a mediating role in the ease or difficulty a child has in relating to those around her. The child brings inborn characteristics to each relationship; caregivers and others in her environment bring their cultural patterns and family dynamics, including their own individual histories. These factors combine to produce the interactions that will, over time, result in the child's relative mastery or nonmastery of what we have labeled the functional emotional developmental capacities. Will the child develop the ability to focus her attention on sights and sounds, and then learn to exchange a series of smiles with her parents? Will the child later learn to communicate using words and ideas? The kinds of interactions regularly available to the child will determine whether she progresses smoothly and adaptively through each successive stage or develops difficulties and disorders along the way.

## **The DIR Model and Philosophies of Mental Health and Illness**

Unfortunately, few children (or adults) who access mental health services ever receive a truly comprehensive, developmentally guided assessment and intervention program. In most cities in the United States and in the world, assessment and treatment are likely to focus far more narrowly on presenting symptoms and observable behaviors. Funding limitations, together with the increased power of managed care companies to control the delivery of health care, have helped shape the current trend toward rapid assessment and time-limited treatment.

A model of mental health and illness that considers only symptoms and behaviors fails to provide a framework for evaluating the adequacy of treatment outcomes. If we limit ourselves to observable phenomena, how are we to determine whether a given treatment improves or undermines a person's capacity to engage in meaningful relationships? Whether it furthers or limits his ability to experience, as well as express, the full range of human feelings, including empathy, compassion, anger, curiosity, loss, and sadness? An overly narrow, phenomenological system of classification, however reliably used, may not pass the fundamental test of validity: it may not actually capture the phenomena it purports to address.

To adequately describe and explain human functioning, we must consider the full range and depth of what it means to be human. Evidence from developmental studies of individuals (Greenspan 1997; Greenspan and Shanker 2004) indicates that human beings

- perceive, move, attend, and self-regulate
- interact, read, and respond to social and emotional cues and experience and express a wide range of emotions such as love, assertiveness, grief, sadness, jealousy, and empathy

- form a sense of self that incorporates many different interaction patterns
- form a sense of self that integrates different wishes, feelings, and emotional polarities, such as love and hate
- regulate mood, behavior, and impulses and engage in ongoing social coregulation of these
- create internal representations, or symbols, that include feelings and wishes, impersonal ideas, and a growing sense of self and others
- categorize internal representations, differentiating between reality and fantasy, self and others, and multiple feelings and wishes; modify wishes and feelings by means of defense mechanisms and coping capacities; and make use of internal representations in self-observation, reflection, and judgment
- broaden and deepen these capacities with each new stage of adaptive development.

To be valid, therefore, any model must address these fundamentally human capacities. All have adaptive developmental sequences and are compromised to varying degrees in different kinds of psychopathology. But how do we define health and pathology? What does it mean to be mentally healthy? Does it mean to be free of symptoms? To have warm, satisfying relationships? To be able to cope with expected stresses? To be successful in one's career? To be joyful and happy?

Does mental health include the ability to tolerate deep levels of loss and sorrow when life's circumstances challenge us? To carry a high moral and ethical standard that can survive even group pressure?

We would answer *yes* to all of the above. As a developmental biopsychosocial approach, the DIR model defines the steps or stages that individuals must master in order to attain the many qualities and capabilities that make up "mental health." As a biopsychosocial model, it offers the promise of understanding internal psychological dynamics while also addressing objective symptoms and other observable, empirically verifiable phenomena.

This model has enabled us to characterize not only healthy development but also the major mental health disorders, enabling early identification as well as prevention. Developmental pathways leading to major depression, bipolar disorder, and other major psychiatric disorders are described in subsequent chapters.

## Conclusion

The DIR model builds on a considerable foundation of infant and early childhood research. It provides a comprehensive developmental approach that works with the child's functional emotional developmental capacities, biologically based individual processing differences, and relationships with parents and caregivers as well as the larger context of family and culture. It guides both assessment and interven-

tion and enables parents to facilitate the emotional and cognitive growth of their infants and young children, even those with significant problems. The goal of the DIR model is not merely to help the child overcome presenting problems but rather to enable the child to return to an adaptive developmental pathway.

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