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The Functional Emotional Stages of Development

The Cornerstone of the DIR Model

The developmental, individual-differences, relationship-based (DIR) model recognizes six early stages of development corresponding to the six core capacities described in Chapter 1 ("A Developmental Biopsychosocial Model"). At each successive stage, the infant or child organizes sensory and emotional experience in increasingly complex ways. We refer to these as *levels of development.* For each level, we first consider the adaptive patterns that characterize that level. We then separately examine the two interrelated dimensions of sensory organization and affective organization.

Level 1: Shared Attention and Regulation (0–3 Months)

Adaptive Patterns: Self-Regulation

At birth or shortly thereafter, the infant is capable of initial states of regulation to organize his or her experience in an adaptive fashion. The early regulation of arousal and physiological states is critical for successful adaptation to the environment. It is important in the modulation of sleep–wake cycles and cycles of hunger and satiety. It is needed for mastery of sensory functions and for learning how to calm oneself and respond emotionally to one's environment. It is also important

for regulation of attention (Als et al. 1982; Brazelton et al. 1974; Field 1981; Sroufe 1979; Tronick 1989). Self-regulatory mechanisms are complex and develop as the result of physiological maturation, caregiver responsiveness, and the infant's adaptation to environmental demands (Lachmann and Beebe 1997; Lyons-Ruth and Zeanah 1993; Rothbart and Derryberry 1981; Tronick 1989).

During a baby's early months, the caregiver provides sensory stimulation through activities such as play, dressing, and bathing. When the infant is distressed, the caregiver normally soothes her to help her return to a calm, organized state (Als 1982). Parent and infant engage in an interactive process of mutual coregulation: the infant uses the parent's physical and emotional state to organize herself (Feldman et al. 1999; Sroufe 1996). This synchronization of states lays the groundwork for the infant's later ability to be emotionally attuned to other people. It is the precursor to social referencing and preverbal communication.

During this early stage of life, the infant is learning to tolerate the intensity of arousal and to regulate his internal states so that he can maintain an interaction while gaining pleasure from it (Sroufe 1979). This has been called *affective tolerance*, or the ability to maintain an optimal level of internal arousal while remaining engaged in the stimulation (Fogel 1982). At first, the parent must act to help regulate the infant's arousal level; once the infant can regulate himself, the parent works to facilitate his self-regulating responses. Brazelton et al. (1974) observed how mothers attempt to synchronize their behavior with their infants' natural cycles. For example, a mother generally reduces her facial expressiveness when her baby gazes away from her but will maintain her expressiveness when the baby looks directly at her (Kaye and Fogel 1980).

An infant who does not develop affective tolerance may withdraw from arousing stimuli. As a result, he may have difficulty forming and maintaining relationships. Field (1977, 1980) proposed an "optimal stimulation" model of affect and interaction. If the mother provides too much or too little stimulation, the infant withdraws. The optimal level varies considerably from one infant to another, depending on the infant's threshold for arousal, tolerance for stimulation, and ability to self-regulate arousal.

Adaptive Patterns: Attention and Interest in the World

In order to perceive the world outside themselves, infants have to want to look and listen. They may have an innate tendency to find human faces and eyes of interest. Klaus and Kennell (1976) described how newborn babies, if allowed to be in close physical contact with the mother right after birth (and anesthesia has not been used), will immediately begin crawling up her belly to find the breast. Infants seem to be born primed to take interest in their world. From the earliest moments of life, however, the infant requires a relationship to fulfill this potential. The rhythmic, near-synchronous patterns of movement and vocalization between infant and

caregiver enable the infant to begin attending to and appreciating the world. In fact, this process begins prenatally. The mother becomes attuned to the fetus's movement patterns and responses to sound and other stimuli, and she begins to fantasize about her new baby. Their emotional relationship has already begun.

Through repeated interactions with the caregiver, a baby gradually becomes more and more interested in sights, sounds, touch, and other stimuli. She begins discriminating between different stimuli. However, just as infants can fail to develop affective tolerance, they can fail to become invested in the world outside themselves. In order to elicit the baby's interest and attention, the stimulation the caregiver provides must generally be emotionally pleasurable. If it is aversive, the baby will withdraw or shut down.

What is pleasant for one infant, however, may be aversive to another. Each infant has her own ways of responding to sights, sounds, smells, touch, and movement. Some babies are highly sensitive and require gentle soothing. Others are underreactive and require more energetic wooing. Some babies discern patterns of sights and sounds quickly, others more slowly. Some will immediately turn toward a new sound or sight, whereas others take longer to notice. The infant therefore depends on her caregiver's ability to fit gaze, voice, and way of moving to her unique way of taking in and responding to the world.

The positive impact of pleasurable stimulation, and the detrimental effects of too much aversive stimulation, on the baby's ability to attend to the world suggests that from the beginning of life, emotions play a critical role in our development of cognitive faculties. In observational studies of healthy and developmentally challenged infants, we have observed that every sensation, as it is registered by the child, also gives rise to an affect or emotion (Greenspan 1979, 1989, 1997). In other words, the infant responds to the sensation's emotional as well as its physical impact. A blanket may feel smooth *and* pleasant or itchy *and* irritating, a toy bright red *and* intriguing or boring, a voice loud *and* inviting or jarring. As a baby's experiences multiply, sensory impressions become increasingly tied to feelings. We call this the *dual coding* of experience.

Humans begin this coupling of phenomena and feelings at the very beginning of life. Infants only days old react to sensations emotionally, preferring the sound and smell of their mothers, for example, to all other voices and scents. They suck more vigorously when offered sweet liquids. By 4 months of age, a child can react with fear to the sight or voice of particular persons who have scared him. In order to understand how and why this dual coding varies from infant to infant, we must first consider the infant's organization of sensory experience.

Sensory Organization

Biologically based variations in sensory and motor functions influence the ability of an infant to simultaneously self-regulate and take an interest in the world. De-

spite widely held, and long-held, assumptions that we all experience sensations such as sound or touch in more or less the same way, significant variations are now known to exist in the ways that individuals process even very simple sensory information. This observation was initially made years ago by Jean Ayres (1964), a pioneer in occupational therapy, and the issue continues to be discussed in the occupational therapy literature.

Each sensory pathway may be hyperarousable (e.g., the baby overreacts to normal levels of sound, touch, or brightness) or hypoarousable (e.g., the baby hears and sees but gives no sign of emotional or behavioral responses to routine sounds or sights). In addition, subtle information processing impairments can be present in each pathway, whether or not that pathway is hyper- or hypoarousable. Problems in the functioning of a pathway can limit the range of sensory experience available to the infant. In our research and clinical work, we have observed babies who brighten up or calm in response to visual experience but have difficulty responding to sound. When presented with auditory stimuli, they may be relatively unresponsive, become overexcited, or appear confused. (A 2-month-old baby may be defined as confused when, instead of looking toward a normal, high-pitched maternal voice and becoming alert, she makes random movements—suggesting that she has indeed heard the sound—yet repeatedly looks past the person making the sound and continues moving randomly.) Other babies appear to have no problems with vision and hearing but have a more difficult time using touch and movement to regulate themselves and connect with their world. Such babies often become irritable in response to even gentle stroking and become hyperaroused when held vertically, calming down only when held horizontally. Still others can calm down only when rocked to their own heart rate, their respiratory rate, or their mother's heart rate. The roles of proprioceptive and vestibular pathways in infant psychopathology are very important areas for future research.

Not only do infants use several sensory pathways, they also integrate experiences across the senses (Spelke and Owsley 1979). Some infants can use each pathway but have difficulty, for example, integrating vision and hearing. They can brighten up in response to a sound or a visual cue, but they cannot turn and look at a stimulus offering visual and auditory information simultaneously. Instead, they appear confused and may even actively avert their gaze or go into a pattern of extensor rigidity.

Another variety of processing disorder may impair the infant's ability to connect a new stimulus with stored images or action patterns. An infant who cannot integrate new sights, sounds, or other sensory information with previous experiences will have ongoing difficulties making sense of his experience.

An infant's experience of sensory pathways is usually observed in sensorimotor patterns. Turning toward a stimulus or brightening and becoming alert can be thought of as motor "outputs." Some babies have trouble integrating their sensory experience with motor output. Most obvious are the difficulties experienced by ba-

bies with severe motor impairments, but it is possible to observe more subtle impairments in such basic abilities as nuzzling in the corner of mother's neck or relaxing to rhythmic rocking. Escalona's (1968) classic descriptions of infants with multiple sensory hypersensitivities require further study as part of a broader approach to understanding subtle impairments in each sensory pathway as well as in higher levels of sensory integration.

Affective Organization: The Dual Code

Because of inborn differences in sensory processing, the emotional experience of a stimulus will vary from infant to infant. Differences in sensory reactivity can make the same sound—for example, a high-pitched voice—strike one person as exciting and invigorating but another as piercing and shrill. A gentle caress may tickle one person but painfully startle another, like a touch on sunburned skin. Each of us, over time and quite unwittingly, creates a personal and sometimes quite idiosyncratic "catalog" of integrated sensory and affective experience.

Furthermore, each of an infant's sensory experiences occurs in the context of a relationship that gives it additional emotional meaning. Nearly all her early feelings, positive and negative, involve the caregivers on whom she depends for survival. Having a bottle, for example, might mean the bliss of love and satiation with a warm, generous mother or fear, hunger, and frustration with a stiff, peremptory attendant who snatches the nipple away on schedule.

The emotional quality of an infant's experience, therefore, is shaped by his sensory organization and the nature of his interactions with caregivers. Impairments in sensory processing and integration, together with maladaptive child–caregiver interactions, may result in the child's inability to organize experience of entire "affective themes," such as dependency or aggression. A baby with a tendency toward hyper- or hypoarousal may have difficulty experiencing joy, pleasure, or exploration, especially if his caregivers are unable to adapt their style of interaction to his needs. Instead, he may become withdrawn and apathetic or disregard entire sensory realms while overfocusing on others (for example, staring for a long time at an inanimate object while ignoring the humans around him).

Sensorimotor dysfunction can profoundly affect a child's emotional and relational experience. Children with sensorimotor dysfunction typically have trouble using the range of sensory experiences available to them for learning; as a result, they may be unable to organize purposeful, goal-directed movement and socially adaptive behavior. These difficulties often cause such children to respond maladaptively in forming emotional attachments. For example, tactile hypersensitivity, high muscle tone, or poor muscle coordination may cause a baby to arch away from her mother when she is held or breastfed; this tendency will affect her mother's ability to respond warmly and consistently, especially if the baby's sen-

sorimotor problems have not been identified and the mother interprets the baby's behavior as deliberate avoidance or evidence of her own inadequacy. An older child with low muscle tone or poor sensorimotor feedback may have problems sequencing actions, a high need for physical contact, or inappropriate affect during interactions with others. As a result, the child may suffer emotionally because she cannot successfully play with her peers.

Some investigators have explored sensory, motor, and affective differences in the context of research on temperament. Temperamental differences have been shown to influence children's intrapsychic development and ways of relating to others (Campos et al. 1989). Temperamental qualities characterized as "difficult," for example, have been linked to later psychopathology (Thomas and Chess 1984). (An infant with a difficult temperament has irregular body functions, unusually intense reactions, a tendency to withdraw from new situations, a generally negative mood, and a tendency to adapt slowly to change [Thomas et al. 1968].) The difficult temperament may create problems in self-regulation and infant–caregiver interactions. It is important to remember, however, that neither sensory nor temperamental characteristics alone necessarily predict psychopathology. The effects of such inborn characteristics can be mediated by the attention of a sensitive, responsive caregiver. A caregiver who feels impatient with or threatened by the infant's sensory or temperamental sensitivity and who reacts with abuse or withdrawal may encourage the infant's reliance on ineffective patterns of behavior and further damage the infant's ability to self-regulate. Even when an infant is constitutionally quite competent at self-regulation, a caregiver can fail to draw the infant into a regulating relationship. Dysregulation may occur, for example, if the caregiver is exceedingly depressed or so self-absorbed that he or she does not soothe or woo the new infant.

We have seen how the emotional quality of the infant's experience influences her ability to master the core competencies of this stage of self-regulation and interest in the world. As the infant grows and explores her world, emotions will help her comprehend even what appear to be purely physical or mathematical concepts. She learns "too hot," "too cold," and "just right" through chilly or comforting bottles, pleasant or painful baths. More complex ideas have a similar basis in feelings. "A lot" is a bit more than makes the child happy; "too little" is less than she expected. "More" is another dose of pleasure or of discomfort. "Near" is snuggled next to mother in bed. "Later" is a frustrating stretch of waiting.

Although time and space eventually take on objective parameters, the emotional component persists. Before a child can count, she must have attained an emotional grasp of *quantity* and *extent*. In our clinical work with children facing various challenges who could nonetheless count and even calculate, we found that numbers and computations lacked meaning to them. We had to provide them with an emotional experience of quantity by, for example, arguing with them about how many pennies or candies they should receive.

Level 2: Engagement and Relating (2–7 Months)

Adaptive Patterns

Once the infant has achieved some capacity for self-regulation and interest in the world, he has a greater ability to respond to his environment and form relationships. With warm nurturing, he becomes progressively more interested and invested in his parents or other primary caregivers. By 2–5 months, he can exchange joyful smiles and coos with his mother and experience a deep sense of intimacy. This capacity for engagement is supported by the infant's inborn ability to selectively focus on the human face and voice and to process sensory information (Meltzoff 1985; Papousek 1981; Papousek and Papousek 1979; Stern 1985).

A baby's experience of his primary caregiver as a special person who brings joy and comfort as well as a little annoyance and unhappiness furthers not only his emotional development but also his cognitive development. He begins learning to discriminate the pleasures of human relationships from his interests in the inanimate world. His joy and pleasure in his caregivers enable him to detect and decipher patterns in their voices. He begins to discriminate their emotional states and interpret their facial expressions. His early experience of emotional engagement and attachment starts him on a lifelong journey of learning to recognize patterns and organize perceptions into meaningful categories.

In forming his first intimate relationships, the baby is also beginning his first lesson in becoming a social being. This experience is the cornerstone of functioning as part of a family, group, or community and later in an entire culture and society.

The early quality of engagement between the infant and his caregivers has implications for later attachment patterns and behavior (Ainsworth et al. 1974; Bates et al. 1985; Belsky et al. 1984; Grossmann et al. 1985; Lewis and Feiring 1987; Miyake et al. 1985; Pederson et al. 1990). *Attachment* was described by Bowlby (1969) as the emotional bond between an infant and his primary caregiver. The infant is biologically prepared to use the primary caregiver as a secure base while exploring the environment, returning to the caregiver for comfort when experiencing challenges. The concept of attachment has been expanded to include the infant's capacity to regulate emotions and levels of arousal within the context of the parent–child relationship (Sroufe 1996). When the infant feels distressed, he signals his caregiver; a sensitive and responsive caregiver reads the infant's signals and responds by helping him attain a calm and regulated state.

Atypical attachment patterns can have a negative impact on children's emotional, cognitive, and interpersonal development (Carew 1980). Longitudinal studies have found that securely attached children tend to have better emotional adaptability, social skills, and cognitive functioning (Cassidy and Shaver 1999).

During the school-aged and adolescent years, children who were securely attached as infants were more likely to be accepted by their peers and were better able to form close friendships (Sroufe et al. 1999). A secure attachment seems to provide a protective mechanism for children whose families experience a high level of stress (Egeland and Kreutzer 1991). The key element that underlies a secure attachment is sensitive and responsive caregiving (Ainsworth et al. 1978; De Wolff and van IJzendoorn 1997).

Note that *attachment* has a specific research meaning in studies such as those just cited. In clinical work as well as considerations of normative development, however, it is useful to consider a broader meaning of the word. This involves the overall pattern of relating between an infant and caregiver, including depth of pleasure and range of feelings experienced in the relationship. The processes that define relationships go significantly beyond definitions used in research paradigms (Greenspan 1997).

Sensory Organization

Some babies can adaptively employ all their senses to experience highly pleasurable feelings in their relationships with primary caregivers. The baby with a beautiful smile, looking at and listening to mother, experiencing her gentle touch and rhythmic movements, and responding to her voice with synchronous mouth, arm, and leg movements is perhaps the most vivid example. Clinically, we observe babies who cannot employ their senses to form emotional bonds. In the most extreme cases, the baby actively avoids sensory—and, therefore, emotional—contact with others. She avoids human sounds, touch, and even scents by chronic gaze aversion, recoiling, flat affect, or random and nonsynchronous patterns of brightening and alerting. Other babies can use one or another sensory pathway to experience a pleasurable human relationship but cannot orchestrate the full range and depth of sensory experience. Such a baby might, for example, listen to mother's voice with a smile but avert her gaze and look pained at the sight of mother's face.

Affective Organization

Primary relationships form the context in which the infant can experience a wide range of "affective themes"—comfort, dependency, and joy as well as assertiveness, curiosity, and anger. A healthy 4-month-old can become negative but also may quickly return to his mother's loving smiles and comforting. However, infants and children can already be constricted in their emotional range. Rather than evidencing joy, enthusiasm, or pleasure with their caregivers, they may wear a flat, uninterested expression. Rather than showing periodic assertive, curious, protesting, or angry behavior, they may exhibit only compliance and shallow smiles.

Babies can also evidence a limitation in the stability of their affective organization. Some babies, after hearing a loud noise, cannot quickly resume their en-

gagement with mother. If the environment is frequently disruptive or for other reasons the child's development continues to be disordered, early attachment difficulties may occur. If severe enough, these may form the basis of an ongoing deficit in the baby's capacity to form human connections and to develop the basic personality structures that depend on internalization of relationship experiences.

Level 3: Two-Way Intentional Affective Signaling and Communication (3–10 Months)

Adaptive Patterns

Beginning in the middle of the first year, humans engage in intentional, nonverbal communication. The infant uses facial expressions, arm and leg movements, vocalizations, and spinal posture to engage in back-and-forth emotional signaling with caregivers. This process can be thought of as opening and closing circles of communication. The 6-month-old smiles eagerly at her mother, gets a smile back, then smiles again. By smiling again, the infant is closing a circle of communication. By 8 months, most infants can participate in many of these exchanges in a row.

The infant's ability to use voice and body to purposefully communicate with others plays a critical role in his cognitive development. His two-way emotional signaling with caregivers helps him begin to differentiate between perceptions and actions. It leads to his earliest sense of causality and logic. A smile and squeal of glee directed at father gets a happy expression and sound from him; playfully grabbing his nose causes dad to say, "toot-toot!" From this point onward, causality and logic can play a role in all new learning. For example, the baby will gradually begin applying his emerging sense of logic to the spatial world and the purposeful use of his body. A dropped rattle falls to the ground, and the baby follows it with his gaze. If his father hides the rattle, the baby will look at and touch his father's hand that just hid the object. This emerging sense of causality can be considered the beginning of the baby's appreciation of "reality," his understanding of the world as purposeful rather than random. Contrary to the theories of Piaget (1962), who contended that the infant first develops mental schemes of causality in relationship to the inanimate world, we believe that a sense of causality emerges in the emotional experience of two-way communication and is then generalized to the inanimate world.

Distortions in the emotional communication process—such as those that can occur when parents project their own feelings onto their infant or respond to the infant's vocalizations and gestures in a mechanical, remote manner—can prevent the infant from learning to appreciate cause-and-effect relationships in the arena of feelings. A baby who does not experience shared warmth, closeness, or compassion may never learn how these feelings are elicited in one person by another. This

kind of impairment can develop even in an infant who seems to be developing a sense of causality regarding inanimate objects and spatial relationships.

Through repeated engagement in reciprocal, purposeful communication, the baby increasingly experiences her own willfulness and sense of purpose. Her consciousness of herself and the world is growing as she gradually differentiates self from other, the physical world from the emotional world, and a sense of purpose or agency from a swirling sea of sensations, feelings, and responses. The baby's early participation in reciprocal communication helps her begin to distinguish between the "me" who is smiling or cooing and the one who is "not me." At this stage, however, the "me" and "not me" are not defined in the baby's mind as whole persons. The baby's "self" is felt to exist only in terms of the smiles or sounds she is exchanging—that is, each "part" of her that is involved in the communication is experienced as a separate entity. In the next developmental stage, these parts of the self will come together.

Sensory Organization

Some babies are unable to orchestrate their sensory experience in the service of purposeful nonverbal communication. A loving glance or smile from mother does not elicit a look, smile, vocalization, or body movement from the baby. Perhaps this baby perceives the visual stimuli offered but is unable to organize his perceptions or responses and as a result either looks past his mother or makes random movements. Some babies can engage in purposeful communication using one sensory pathway but not another. For example, when presented with an object, the baby may look at it with interest and then examine it. When presented with an interesting sound, however, the same baby does not respond vocally or reach toward the source of the sound but instead behaves chaotically, flailing his limbs and banging his head. A baby who can use his sense of touch in an organized manner may touch his mother's hand in response to mother gently stroking his stomach, whereas a baby with problems processing tactile experience may respond with random or chaotic movements that appear unrelated to the gentle stimulus.

As we can see from these examples, compromises in sensory processing may limit the strategies available to the infant for engaging in purposeful communication. Motor characteristics, such as high or low muscle tone or lags in motor development or motor planning, can affect the infant's ability to signal her feelings and wishes. As a result of such compromises, certain sensory or motor pathways may never become organized at the level of purposeful two-way communication, thus never becoming available to the infant as modes of learning about cause and effect. As we discuss later, these sensory organizational lags have implications for the baby's affective development as well.

At this developmental stage, we begin seeing a shift from proximal to distal modes of communication. *Proximal modes* involve direct physical contact, such as

holding, rocking, and touching; *distal modes* involve communication that occurs across space through visual stimuli, auditory cuing, and emotional signaling. A crawling 8-month-old can maintain an emotional connection with his caregiver through reciprocal glances, vocalizations, and emotional gestures. Some babies, however, continue to rely primarily on proximal modes for a sense of security and connection. Early limitations in negotiating space, as we discuss later, can affect the baby's ability to construct internal representations of human relationships.

Affective Organization

In healthy emotional development, the full range of emotions evident in the attachment phase will also be played out in purposeful, two-way communication between the infant and her caregivers. An 8-month-old can experience causality in the area of dependency (she reaches out or makes other overtures to be held and cuddled). She smiles with pleasure at being touched, unless she has a tactile sensitivity. She communicates curiosity and assertiveness as she reaches for the rattle in her babysitter's hand, expresses anger and protest as she intentionally throws food on the floor, and looks at her mother as if to say, "What are you going to do now?" Eight-month-olds can even express defiance, which they often do by biting or butting their heads, because they have better control over their mouths, heads, and necks than over their arms and hands.

When the caregiver fails to respond to the baby's signal, we have observed that the baby's affective-thematic inclinations may fail to become organized at this developmental level. That is, the baby's feelings do not become differentiated from his caregiver's but remain synchronous, as in the attachment phase, or shift from synchronicity to a more random quality. Perhaps the baby can experience a full range of emotions, but these do not become organized into purposeful cause-and-effect interchanges.

A lack of reciprocal responses from caregivers causes many babies to develop a flat affect and a hint of despondency or sadness. This can happen even to babies who have previously exhibited joyfulness and adaptive attachment. In some of these cases, it seems that the baby becomes flat and subdued because caregivers continue to offer only more primitive forms of relatedness instead of advancing to the kinds of interactions that the baby is now capable of. The baby, failing to get a response to her purposeful attempts at communication, does not experience the sense of efficacy that comes from making an impact on other people. Most interesting are the subtle cases in which the baby can reciprocally communicate certain feelings and themes, such as pleasure and dependency, but not others, such as assertiveness, curiosity, and protest. We can imagine how such uneven development occurs as a result of the baby's own temperament and the consequences of expressing each type of feeling in her specific environment. For example, parents who are uncomfortable with closeness and dependency may fail to engage their baby in

back-and-forth communication in this domain, while readily engaging her in the less intimate areas of assertion and protest. The baby's own affective-thematic "sending power," combined with the varying responses her communications elicit, may have important implications for how she internally differentiates emotions as well as for how she organizes her internal experience at the symbolic or representational level later on.

Level 4: Long Chains of Coregulated Emotional Signaling and Shared Social Problem Solving (9–18 Months)

Adaptive Patterns

During the second year, the infant makes momentous strides. He begins taking a more active role in developing and maintaining reciprocal relationships with his parents (Bell 1977; Goldberg 1977; Reingold 1969). His interactions with them become increasingly complex (Cicchetti and Schneider-Rosen 1984; Greenspan and Porges 1984; Talberg et al. 1988; Tronick and Gianino 1986). His communication is still largely preverbal, yet he can organize a long series of problem-solving interactions. He takes his father by the hand, gestures with his eyes and hands toward the kitchen door, leads him into the kitchen and up to the refrigerator, and points to the juice carton inside. Assuming his caregivers are able to read his signals and respond to them appropriately, the child increasingly develops the ability to use and respond to social cues, eventually achieving a sense of competence as an autonomous being in relationship with significant others (Brazelton and Als 1979; Lester et al. 1985).

In taking a parent by the hand to go to the refrigerator, a child is learning pattern recognition in several domains. These include her own feelings and desires; the action patterns involved in taking her father's hand, getting to her destination, and getting the object she wants; the visuospatial patterns involved in going from one room to the next and then to the shelf where the juice resides; the vocal patterns needed to get her father's attention; and the social patterns involved in working together with parents toward a common goal. Pattern recognition involves perceiving how the pieces fit together. It enables the child to move beyond isolated, piecemeal actions and to create increasingly elaborate, integrated combinations of emotions and behavior.

As the baby organizes his emotions and behavior into patterns, an early sense of self is forming. At the previous stage, through his involvement in purposeful, two-way communication, he began to distinguish between "me" and "not me." As his repertoire of emotional signaling becomes richer and he begins to discern patterns in his own and others' behavior, he adds these observations to the map delin-

eating himself and others as people. He learns that his mother usually responds when he makes friendly requests but not when he's fussy. His father loves to roughhouse but will not sing lullabies. Grandma lets him do things neither parent would allow. Which actions reap affection and approval? Which yield only rejection or anger? Is he worthy of care, attention, and respect? Are those around him also worthy?

As the child improves her ability to imitate others, she begins copying not just discrete actions but large patterns encompassing several actions. She puts on her mother's hat, picks up her purse, hangs it over her own shoulder by the strap, and walks around the house in imitation of her mother's stride. Her ability to discern and create patterns, together with her growing capacity for complex signaling, now enables her to negotiate multiple relationships at the same time. She can send a mischievous grin to dad and immediately follow it with an irritated glance at mom. The toddler's capacities for problem-solving communication, multiple relationships, and rapid learning of whole patterns through imitation lay the foundation for her ability to participate in groups, beginning with her family and moving outward to her community, society, and culture.

Pattern recognition, ideally learned first through social interactions, can then be applied to the physical world as well. Turning this shiny silver knob causes water to gush out of a faucet; holding your palm under the water causes splashing and spills and may bring mother running to turn off the water. Seeing the world in patterns increases understanding of how it works, enabling the child to have expectations and make predictions and thus increasing his sense of mastery. The ability to recognize and organize patterns is an essential component of intelligence, one that the child will build on the rest of his life.

The toddler is simultaneously strengthening several other abilities. More complex vocalizations are emerging, and the child may develop a private language as a prelude to learning the family's language. She develops a more elaborate sense of physical space and improves her visuospatial problem-solving as she learns to search the house for desired toys or people. These developmental gains occur because physical space is now invested with emotional meaning through the pursuit of emotional goals.

Similarly, through interactive play, the child rapidly learns to plan and sequence actions. Given a new toy truck, he may load it, unload it, move it to one side of the room, then back to the other side.

Well before she acquires language and symbols, therefore, the typical child has developed the basic skills that will enable her to learn about her world. She has become a scientific thinker, figuring out and implementing new solutions all the time. She is learning not only about her family and the physical world but also about her culture. Through increasingly complex, emotionally laden chains of interaction with her caregivers, she obtains continual, often unspoken cues and feedback informing her what is good and bad, what is acceptable and unacceptable. Is defiance permissible? Is it better to be aggressive or passive? What's the correct way

to greet another person? All of these cultural attitudes and patterns can be learned even before symbolic thought is eminent.

Sensory Organization

A baby's organization of behavior into increasingly complex patterns can be viewed as a task that involves coordinated and orchestrated use of the senses. To reach this level of development, the baby has to be able to process sights and sounds, use reciprocal motor gestures, and comprehend spatial relationships. A toddler who can use vision and hearing to perceive various vocal and facial gestures, postural cues, and complex emotional signals from others is able to extract relevant information and use it in interactions. A toddler who cannot incorporate certain sensory experiences as part of his early cognitive and affective abstracting abilities (Werner and Kaplan 1963) may show signs of a very early restriction in sensory information processing.

Balanced reliance on proximal and distal modes of communication becomes even more important during this stage of development. By looking, listening, and vocalizing across space, a mobile toddler can enjoy her freedom while maintaining her connection with her caregiver. She does not have to tolerate a great deal of insecurity because she can "refuel" (Mahler et al. 1975) distally, moving closer for a cuddle or other proximal contact when necessary. Some children, however, have trouble using distal modes to remain in contact and need to stay physically close to the caregiver. Although this reliance on proximal modes of communication may reflect feelings of insecurity generated by an ambivalent primary caregiver, limitations in the child's own sensory organization can also make important contributions to this pattern.

As a child develops his capacity for complex problem-solving interactions and pattern recognition, he increases his ability to modulate his sensory experience. He is less likely to become overwhelmed or underaroused by sensory stimuli because he can actively participate in shaping his experience of these. He can reach out for just a bit more touch, vocalize to hear just a bit more sound. He can use looks, hand gestures, or body posture to slow down an interaction that has started to become overwhelming.

Affective Organization

As the toddler strings together long chains of back-and-forth communication, her interactions encompass a range of emotions. A healthy toddler may start with a dependent interaction such as cuddling and kissing her parents; shift to an enjoyable, giggly interchange with them; and then jump down and assertively dash into a room she knows is off limits, inviting pursuit. When the parents respond by saying, "No, you can't go in there!" protest and negativism may emerge. Under optimal circumstances, the interaction might close with the toddler back in the

playroom, sitting on a parent's lap, enjoying her favorite book. Here the child has gone full circle, suggesting she has made connections between the many affective themes.

The toddler's growing capacity for pattern recognition, developed through repeated experiences of emotional interaction, enables him to become increasingly sophisticated at distinguishing between emotions. He learns to tell approval from disapproval, acceptance from rejection. He begins to use this ability in increasingly complicated social situations. Is his mother's tense face a signal that she is angry with him? The child begins to respond differently to people depending on their emotional tone. For example, he may pull away from a situation that feels undermining. The intuitive ability to decipher human exchanges by picking up emotional cues before any words have been exchanged becomes a "supersense" that often operates faster than our conscious awareness. This supersense is the foundation of our social life.

In a very young infant, anger is explosive, and sadness feels like it will go on forever. Daily loving exchanges and struggles with sensitive caregivers will gradually enable the toddler to turn these raw, extreme emotional reactions into feelings and behavior that are more regulated and modulated. Once a child can exchange rapid, back-and-forth emotional signals with her caregiver, she is able, in a sense, to negotiate how she feels. If she is annoyed, she can make a sound or hand gesture expressing this. Her mother may come back with a gesture indicating, "I understand," or "OK, I'll get your snack more quickly," or perhaps, "Can't you wait just one more minute?" Whatever her response, the child gets immediate feedback that helps her modulate her own response. Her frustration may be tempered by the sense that mother is going to do something to help, even if she cannot do it immediately. Just the sound of mother's voice signals that she is getting that bottle ready, and it is coming soon. If the mother can use a soothing voice and gradually calm the toddler, she will learn not to get so frantic. With a fine-tuned reaction rather than a global and extreme one, she will not need to have a tantrum to register annoyance; she can do it with an expressive glance. Even when an emotionally healthy toddler does escalate to a real tantrum, she does not jump from 0 to 60 in 1 second.

For various reasons, a child may lack the experience of nurturing exchanges that enable him to learn to regulate and modulate feelings. Perhaps he has a motor problem that prevents him from gesturing and signaling well. Perhaps his motor skills are normal but one or both parents are too intrusive and anxious, or too self-absorbed and distant, to respond appropriately to his signals. Such a child gets no feedback fitting his emotional expressions, and he comes to learn that his emotional signals will not lead to a response. His expression of feelings, therefore, never becomes part of a signaling system. It is simply an isolated expression of feeling.

Without the modulating influence of an emotional interaction, the child's feeling may grow more intense, or she may give up and become passive and self-

absorbed. In either case, the child is left with only global feelings of anger or rage, fear or avoidance—the sorts of feelings characteristic of very young infants in the early months of life. One of us (S.G.) often sees such children in his practice. In many cases, the children continually hit or bite. The parents seek help, expressing concerns about "aggression" and often requesting that their child be medicated. If the parents are given coaching on how to read the child's signals and respond consistently and calmly, however, within a few months these children can become well-regulated, highly energetic toddlers.

If parents continue to respond inappropriately or not at all, however, the child can become even more vulnerable. Left in the clutches of raw, powerful emotions, many children tend to become more anxious and fearful. When caregivers tune out, freeze up, or slow down too much in response to fierce anger from their infants and toddlers, the child may feel a sense of loss, which can increase her tendency to depression. When anger and impulsive behavior are met by abrupt withdrawal or a single intense, punitive reaction, the child's aggression and impulsiveness tend to increase.

At this developmental stage, children who do have sufficient experience of modulating interactions will begin to develop a more integrated sense of themselves and others. Somewhere between 18 and 24 months of age, a child can experience "me" as no longer just the smile or vocalization or feeling of the moment but as a whole person. Emotional polarities are united in that whole person: the "me" who feels happy is the same person who another time feels angry. "Nice mommy" is no longer experienced as a completely separate person from "frustrating mommy."

Our research on early emotional signaling is shedding some light on the genesis of gender differences. Although individual boys and girls vary considerably, as a group girls tend to develop more empathy and earlier language skills than boys. Prevailing theories state that these gender differences result from differences in the brain structures or hormones of human males and females. Our hypothesis is that, instead, preverbal learning experiences are responsible. Beginning in the cradle, we teach boys and girls differently.

We believe that girls develop deeper empathy and earlier language skills because adults engage female infants and toddlers in longer preverbal emotional "conversations" than they do boys. As a group, boys tend to be more active as babies, inviting shorter bursts of back-and-forth signaling and more roughhousing or other physical play. By regularly engaging girls in longer chains of communication, we enable them to better recognize, modulate, and regulate a wide range of emotions. These abilities lead to earlier symbolic and language skills as well as empathy and concern for others.

Is it any wonder that a child with more extensive early experience in navigating her emotional terrain will grow up better able to understand and express how she feels? Or that a boy who missed out on extensive early emotional interchanges

might have some of the deficits or problems we think of as typically male, such as an inability to acknowledge his feelings, a strong desire to separate his emotional world from his rational one, or a habit of using withdrawal or explosive action to discharge uncomfortable feelings?

Our studies of autism also suggest an important role for the affective problem-solving interactions that are a hallmark of this developmental phase. Children with autism, we believe, have a biologically based difficulty in connecting emotion to their emerging capacity to plan and sequence their actions. Histories and videotapes of autistic children's interactions during their formative years show that although some of the children could engage with caregivers and minimally signal emotions, they never got to the point of being able to take a parent by the hand to find a toy or to open and close 50 circles of affective communication. They were thus blocked from moving to higher developmental levels. Using symbols meaningfully, for example, requires investing symbols with regulated and integrated emotions: "Mom" is understood as the total of one's emotional experiences with mother. Fortunately, extra practice with meaningful emotional interactions can help children master such interactions and move on developmentally. In a chart review of 200 children with autism spectrum disorders, we found that a comprehensive program to develop this capacity could help the majority of them master goal-directed emotional interactions; become meaningfully verbal, empathic, creative, and reflective; and have solid peer and family relationships (Greenspan and Wieder 1997).

Level 5: Creating Representations (or Ideas) (18–30 Months)

Adaptive Patterns

Assuming the toddler has had plenty of opportunity for emotional interactions, toward the end of her second year she can more easily separate perceptions from actions and hold freestanding images, or representations, in her mind. Related to the ability to create internal representations is the capacity for "object permanence." Object permanence, which is relative and advances through a series of stages, involves the toddler's ability to recall that an object hidden from view still exists and to search for it (Gouin-Decarie 1965). Internal sensations and unstable images gradually become organized in the child's mind as multisensory, emotionally laden images that can be evoked and are somewhat stable (Bell 1970; Fenson and Ramsay 1980; Gouin-Decarie 1965; Piaget 1962). This capacity is somewhat fragile between 16 and 24 months, but it soon becomes a dominant mode in organizing the child's behavior.

As the child learns to control his tongue, other mouth muscles, and vocal cords, he can begin forming words to label internal representations. If he has had

a broad range of emotionally relevant experiences, he will now be able to create a broad range of meaningful labels or symbols.

As a child acquires new words, the words become meaningful to the degree that they refer to lived emotional experiences. When children are neurologically capable of speaking but do not learn to create emotionally meaningful images and symbols, the result is very different. The child could see a picture of a chair and say, "chair." She could also complete rote memory tasks. Yet she would be unable to say, "Mommy, come play with me!" or "I don't like that!" Such a child would never develop meaningful spoken language. Nor would she understand written language. She might learn to read and regurgitate back a series of words, such as "red hat, green hat, blue hat," but would be unable to tell you the meaning of a story or the motives of its characters.

The development of language moves through several levels:

1. *Words accompany actions.* The child bangs on a table, saying "hit!" He cannot yet use ideas or words in place of actions.
2. *Words are used to convey bodily feeling states.* "My muscles are exploding." "Head is aching."
3. *Action words conveying intent are used in place of actions.* "Hit you!"
4. *Words are used to convey emotions, but the emotions are treated as real rather than signals.* The child says, "I'm mad!" or "I'm hungry," rather than "I feel mad" or "I feel hungry." In the first case, the feeling state demands action and is very close to action; in the second, the words are a signal for an internal experience, a signal that makes possible a consideration of many possible thoughts and actions.
5. *Words are used to signal feelings, as in the second case above, but these are mostly global, polarized feeling states ("I feel awful," "I feel good.").* The prevalence of polarized feeling words continues throughout this developmental stage and can also characterize stage six, when children begin using logic to make connections between ideas. If it persists into later childhood, however, it can indicate a constriction in the child's mastery of these two levels of development.

Although we have emphasized the child's acquisition of words, which is a cornerstone of most intellectual endeavors, the capacity to construct symbols occurs in many domains. It gives rise to higher levels of intelligence in all of them. The child can now form visuospatial representations, as when a preschooler builds a toy house and describes what goes on in each room. She can plan and sequence actions symbolically, as when she runs a toy bus from the house to the school to pick up some children.

In addition, the child can now use symbols to manipulate ideas in his mind without actually having to carry out actions. This gives him tremendous flexibility in reasoning and thinking, because he can now solve problems mentally.

The child's ability to construct symbols enables her to share meanings with others, which in turn facilitates her ability to describe herself and to understand the difference between herself and others. Her consciousness of "me" and "not me" now involves internal images rather than simply integrated behavior patterns, as in the previous stage. Her development of perspective coincides with the early stages of empathy and prosocial behavior (Butterworth 1990; DesRosiers and Busch-Rossnagel 1997; Meltzoff 1990; Pipp-Siegel and Pressman 1996; Stern 1983).

Symbols, however, do not create consciousness. Rather, they provide a new way of labeling and expanding consciousness. Symbolization and language build on a sense of self and the outer world that was already well established. When the presymbolic experience of emotional signaling and problem-solving is insufficient to provide a beginning emotional knowledge of the world, as we see in some children with autism, the child cannot use words as true symbols. Instead, they are empty containers of memorized scripts.

Sensory Organization

A person's mental representation, or idea, of an object or person is a multisensory image that integrates all the object's physical properties as well as levels of meaning abstracted from the person's experiences with the object. The object is at once a visual, auditory, tactile, olfactory, vestibular, and proprioceptive object as well as one that is involved in various emotional and social experiences. Therefore, the range of senses and sensorimotor patterns a child employs in relationship to his world is critical. If the child's range, depth, or integration of sensory experiences of objects in the world is limited, his construction of representations will be limited as well.

Affective Organization

A child who has reached the level of representational thinking now has the tools she needs to label and interpret feelings rather than simply act them out. A verbal 2½-year-old displays this interpretive process when she says, "Me mad" or "Me happy." Because many children have language delays, however, pretend play is an even more reliable indicator of the ability to label and interpret. A child who as yet says little can already present a vivid picture of her representational world by pretending her dolls are feeding each other, hugging each other, or fighting with each other.

Between ages 2 and 5, children who are able to experience and communicate emotions symbolically develop the capacity for higher-level emotional and relational experiences. They develop the capacity for empathy. Their loving feelings toward themselves and others become more consistent and better able to survive separations and affect storms such as anger. Later on, they will become able to experience loss, sadness, and guilt.

Level 6: Building Bridges Between Ideas: Logical Thinking (30–48 Months)

Adaptive Patterns

At this level, the child moves beyond having discrete internal images and labeling them. He now develops the ability to make logical connections between two ideas or feelings. Instead of simply knowing, and saying, "Me mad!" he can think, and say, "I'm mad because you hit me." He learns to make a variety of logical connections, including understanding how one event leads to another ("The wind blew and made the tree fall down"); how events are connected across time ("That girl let me play with her doll yesterday, I bet she will tomorrow, too" or "If I'm bad right now, I'll get in trouble later"); and how events are connected across space ("Mom is not here beside me, she's down in the basement"). He learns to use ideas to understand his feelings: "I'm happy now because Sally's coming over to play").

The ability to make such connections is the basis for a whole host of capacities associated with healthy mental functioning. A child who can make logical connections will be able to differentiate her own feelings, making increasingly subtle distinctions between emotional states. She will be able to say whether she is feeling angry or merely frustrated. Her earlier experiences of back-and-forth communication have already helped her feel the difference between "me" and "not me." The capacity for logical connection takes this process to the next level, making reality testing possible by enabling the child to categorize experiences into those originating inside herself ("make-believe") and those originating outside ("real"). Similarly, she can begin to understand the relationships between her own thoughts, feelings, or actions and those of other people. This makes it possible for her to reason, argue with others, and answer "why" questions. It forms the basis of new social skills, such as following rules and participating in groups.

Because the child can now understand the logical connections between different feeling states, his sense of self becomes more complex and sophisticated. Not only does he realize that "angry me" and "happy me" are the same person, he is able to reflect on how these parts of himself relate to each other: "When you don't let me do what I want, I'm mad. When you're nice to me, I'm happy and then I'm nice back."

Sensory Organization

The child is now learning to understand what she hears, sees, touches, tastes, and smells in a more complex way. She faces the challenge of categorizing sensory information along many dimensions—past, present, and future; closer and farther away; appealing and distasteful—and thinking about the relationships among her sensory and emotional experiences. To meet these challenges, the child needs to be

able to organize information coming from each sensory pathway, and her sensory pathways need to work together smoothly. Any impairment in sensory processing will likely compromise her ability to make meaning of her sensory experience. For example, if she cannot distinguish between certain sounds, she will have trouble understanding words. If she confuses different spatial images with one another, she will be unable to think in a clear and organized manner about what she sees. If she has poor short-term memory for either auditory or spatial symbols, she will lose important information before her mind can combine and compare it with other information in order to abstract meanings. In turn, such impairments in the ability to think abstractly will compromise the child's very ability to categorize her experience.

What he needs to be able to categorize, of course, are not just simple, static sensory stimuli but complex emotional and interpersonal experiences that keep changing over time. Sensory processing difficulties, if not addressed, can cause people to spend much of their lives confused, unable to make sense of themselves or their world.

Affective Organization

At this developmental stage, we observe the child's experiences and expression of affective themes become broader and deeper. The child's relationships and pretend play show an increasingly wide range of themes, including dependency and closeness, pleasure, excitement, curiosity, aggression, self-control, and the beginnings of empathy and consistent love. One frequently sees a child of this age repeatedly enact a scene in which one doll feeds or hugs another. Over time, assuming the child is experiencing a healthy range of parental interactions, the dramas the child initiates will expand to include scenes of dolls experiencing separation, competition, aggression, injury, death, recovery, and more.

Simultaneously, the child's pretend play and use of language are becoming increasingly complex, showing a growing understanding of causality and logic. The content of play may be fantasy, but the stories make logical sense: a prince slays a dragon *because* the dragon stole a treasure or kidnapped a princess. In conversation, a 3½-year-old child can correctly use the words "but" and "because" and argue in lawyerly fashion: "I can't eat that food because it looks icky and it will make me sick."

In our discussion of Level 1, self-regulation and interest in the world, we argued that from the beginning of life, all experience has an emotional component. The child's capacity for logical thinking, like his earlier developmental capacities, arises out of emotional experience, resulting as it does from his repeated interactions with primary caregivers. Parents have to be able not only to engage their child in such interactions, but to interpret and name the child's feelings correctly and consistently from day to day. For example, if a child frequently plays with toy guns

and the parents see this as aggression on one day, an expression of sexuality the next day, and an indication of the child's need for closeness on the third day, their responses will vary widely and will likely confuse the child. The child may never develop a stable, realistic sense of what behavior and feelings mean. Similarly, some parents regularly project their own feelings onto their child, with the result that the child ends up sharing his parents' confusion about which feelings emanate from inside him and which belong to other people. Formation of a realistic understanding of the world can also be compromised if parents consistently fail to set limits, depriving the child of feedback that would let him learn the logic of action and consequence, cause and effect.

In contrast to the views of Freud (1900/1958) and Mahler et al. (1975), children do not appear to go through a distinct period of magical thinking followed by one of reality-oriented thinking. Instead, the ability to separate magical from realistic thought seems to develop gradually, through repeated experiences of getting logical, meaningful feedback from parents or other caregivers.

The ability to see the world realistically and logically is critical not only in human relationships but also in the ability to succeed at what are commonly thought of as purely cognitive or academic tasks, such as learning math and reading. As we will see in our later discussions of assessment and treatment, a thorough evaluation of a child with attention or learning disabilities often reveals that these academic problems have their roots in the child's early emotional interactions. Coaching parents on how to interact in healthier ways, as well as addressing any sensory impairments affecting the child's ability to interact, can result in impressive gains in academic skills.

Advanced Levels of Development

If a child masters the functional emotional capacities associated with Levels 1–6, she is able to move on to more advanced ways of thinking and experiencing: multicause and triangular thinking; gray-area, reflective thinking; and an internal standard of thinking. These are addressed briefly in Chapter 3 ("Assessment"). The DIR model defines additional levels that can be reached in adolescence and adulthood. (For a brief description of these levels, see Table 11–1, Functional Emotional Developmental Levels From Infancy to Adulthood, in Chapter 11, "A Model for Comprehensive Prevention and Early Intervention Services for All Families.")

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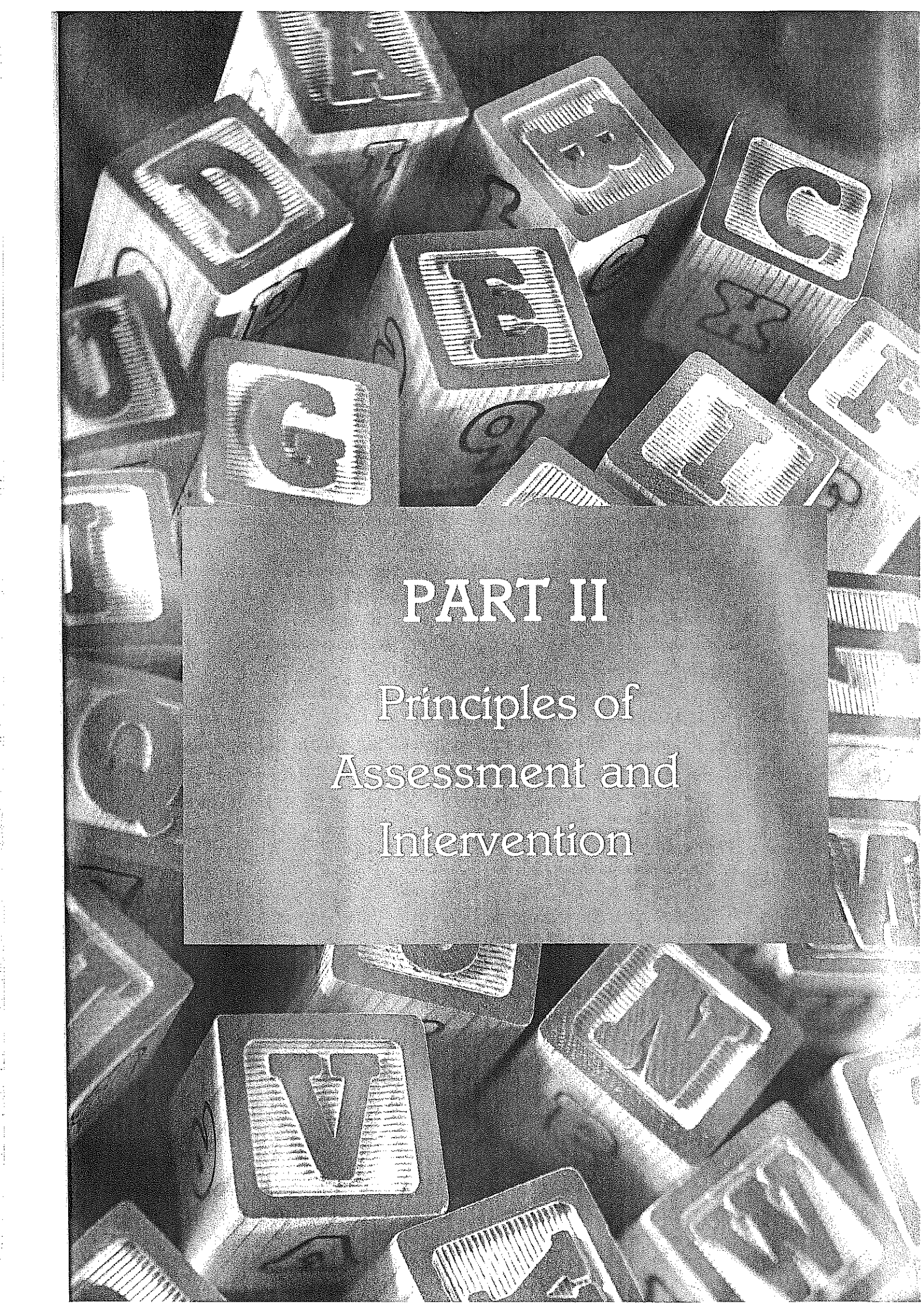

PART II

Principles of Assessment and Intervention