

# Understanding Newborn Behavior & Early Relationships

The Newborn Behavioral Observations (NBO)  
System Handbook



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Foreword by  
T. Berry Brazelton

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*with invited contributors*

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# 1

## AN INTRODUCTION TO THE NEWBORN BEHAVIORAL OBSERVATIONS SYSTEM



**T**his chapter is divided into three sections. The first section describes the history, content, and uses of the Newborn Behavioral Observations (NBO) system; the second section presents the underlying theoretical assumptions of the NBO; and the third section presents a series of clinical principles that govern the use of the NBO.

### BACKGROUND OF THE NEWBORN BEHAVIORAL OBSERVATIONS SYSTEM

This section describes the history, content, and uses of the Newborn Behavioral Observations (NBO) system.

#### History

The development of the NBO is based on more than 30 years of research and clinical practice with the Neonatal Behavioral Assessment Scale (NBAS) and was shaped by the authors' clinical work in a variety of environments working with infants and families. It also was inspired by the formative influence of T. Berry

Brazelton, whose teaching and mentoring have shaped the authors' understanding and appreciation of newborn behavior on the one hand and molded their clinical stance toward parents and families on the other hand. His pioneering work with the NBAS on the nature of individual differences in newborn behavior and his respectful, nonjudgmental clinical stance toward parents in his clinical teaching influenced both the content and the clinical approach of the NBO.

In terms of helping both scientists and practitioners understand the newborn infant, it is widely recognized that the single most important advance in the study and the assessment of the newborn infant was the development and publication of the NBAS by Dr. Brazelton and his colleagues in 1973 (Brazelton, 1973, 1984; Brazelton & Nugent, 1995). For much of the 20th century, it had been assumed that the newborn infant was a *blank slate*—a reflex organism that operates at a brain stem level. However, a new body of research on newborn capabilities in the 1960s and 1970s and the introduction of the concept of *newborn behavioral state* by Wolff (1966) led to a greater appreciation of the human newborn as a responsive organism capable of organized behavior, which, in turn, contributed to the development of a new generation of neonatal scales. Because it yields a comprehensive description of newborn competencies on the one hand and identifies individual differences in newborn behavior on the other hand, the NBAS can be said to have begun where other scales left off.

Extensive research has shown that the NBAS is sensitive to a wide range of perinatal variables, such as the effects of intrauterine growth restriction; the prenatal ingestion of cocaine, alcohol, caffeine, and tobacco; or the effects of prematurity. The NBAS remains the most comprehensive assessment of newborn behavior available; as such, it can be said to have played a major role in expanding the understanding of the phenomenology of newborn behavior.

Although the NBAS has been used primarily as a research instrument, it also has been used as a clinical or educational tool to attune parents to their infant's capabilities (Nugent, 1985; Nugent & Brazelton, 1989, 2000). The scale has been adapted or modified to render it more effective as a teaching tool for parents. A number of scales were developed for use in clinical environments, as a form of parent education or intervention. Field et al. (1978) developed the Mother's Assessment of the Behavior of the Infant to involve mothers actively in the assessment of their child. By incorporating behavioral items and concepts from the NBAS into the routine physical pediatric examination, Keefer (1995) developed the combined physical and behavioral neonatal examination to help promote a more parent-centered approach to pediatric care. Gomes-Pedro et al. (1995), in their efforts to sensitize parents to the behavior of their newborns, effectively tested a shortened version of the NBAS for use as the newborn pediatric discharge examination. Cardone and Gilkerson (1990) also used the concepts of the NBAS to develop the Family Administered Neonatal Activities.

With the growing recognition of the importance of the newborn period as a unique opportunity for preventive intervention with families, Nugent (1985) developed a manual for clinicians, providing guidelines on how to use the NBAS as a teaching tool in clinical environments. The approach itself and the manual can be said to be the precursor to or the first iteration of the NBO and the training material described in this handbook. A series of studies, summarized by Brazelton and Nugent (1995) and Nugent and Brazelton (1989, 2000), showed that demonstrating the newborn infant's behavioral capacities to parents can serve as a mechanism for helping parents learn about their new infant, thereby strengthening the relationship between parent and child and supporting the family adjustment. Specifically, a number of studies consistently have reported positive effects of exposure to the NBAS on variables such as maternal confidence and self-esteem, paternal attitudes toward and involvement in caregiving, parent–infant interaction, and developmental outcome. Parker, Zahr, Cole, and Brecht (1992), for example, invited mothers to participate actively in the behavioral assessment of the infant in the neonatal intensive care unit environment, and Rauh, Achenbach, Nurcombe, Howell, and Teti (1988) used the NBAS serially in the neonatal intensive care unit as a teaching tool with mothers of low birth weight infants. Studies by Anderson and Sawin (1983), Beeghly et al. (1995), Gomes-Pedro et al. (1995), Hawthorne-Amick (1989), Myers (1982), Rauh et al. (1988), Widmayer and Field (1981), and Worobey and Belsky (1982) and the meta-analysis by Das Eiden and Reifman (1996) all reported positive effects of the NBAS on various developmental and parenting outcomes. The results from these controlled studies encouraged us to develop the Newborn Behavioral Observations system as a tool clinicians could use to support parents and strengthen their relationship with their infant.

## Content and Uses of the NBO

The NBO system, initially known as the Clinical Neonatal Behavioral Assessment Scale, comes from this tradition and grew from the authors' desire to provide clinicians with a scale that retained the conceptual richness of the NBAS but shifted the focus from assessment and diagnosis to observation and relationship building. The underlying concepts of newborn behavior, therefore, are complemented by theoretical principles that describe the transition to parenthood and the nature of the parent–infant relationship and by clinical principles that describe the nature of relationship building in clinical practice. Moreover, the NBO was designed to be flexible and easy to use so that it could be integrated easily into the care of newborn families, whether in hospital, clinic, or home environments.

The NBO was created to sensitize parents to their infant's competencies, with a view to helping them understand their infant's behavior and thereby promote positive interactions between parents and their new infant and contribute to the

development of a positive parent–infant relationship. It is conceived of as an interactive system, one in which parents play an active role in both the observations of their infant’s behavior and the identification of appropriate caregiving strategies. Therefore, although the theoretical principles that guide the use of the NBO and the accompanying training program include many of the conceptual themes that informed the NBAS, they also are informed by theoretical and clinical principles from the fields of child development, behavioral pediatrics, nursing, developmental and clinical psychology, physical and occupational therapy, early intervention, and infant mental health.

The NBO is made up of 18 behavioral observations. These items were selected to operationalize the theoretical framework on which the NBO was based. They draw on the understanding of the richness of the newborn’s behavioral repertoire, on the appreciation of the wide range of variability in newborn behavior, on the understanding of the developmental agenda of the human newborn across the first months of life, and on the understanding of the developmental challenges that parents face in these early months. The items that are included in the NBO also incorporate the understanding of the ontogeny of the parent–infant relationship in the transition to parenthood and the influence of the infant on the parent–child relationship. The NBO items include observations of the infant in sleep, awake, and crying states and the degree to which the states are integrated or organized. The individual behaviors were selected to represent the developmental tasks that newborns face across the first months of life and were designed to capture the process by which the autonomic, motor, organization of state, and responsivity (AMOR) domains become integrated. The autonomic domain is represented by observations of the infant’s response to stress, such as the amount of color change, startles, or tremulousness. Observations of motor tone in the arms and legs, activity level, the crawl response, and sucking and rooting reflexes represent the motor domain. The infant’s state regulation, or the organization of state domain, is captured by observations of the infant’s capacity for habituation or sleep protection, the amount of crying, and the ease with which he or she can be consoled or his or her capacity for self-consoling and the nature of transitions between states. Finally, the infant’s response to visual and auditory stimulation, including social interaction, represents the attentional-interactive domain, or the responsivity domain.

The NBO may take between 5 and 10 minutes to administer if all of the 18 behaviors can be observed, but its length and, indeed, its focus will be shaped not only by the infant’s behavior and the needs of the parents but also by the nature and the clinical goals of each particular session. For that reason, it may take 5 minutes or 1 hour, depending on the goals of the clinician, the needs of the family, and the nature of the relationship between the clinician and the family. The NBO is appropriate for use from birth to the third month of life and can be used in a range of clinical environments, including in-hospital, outpatient, and in-home environments.

Administration of the NBO must be flexible, and the administration sequence is always driven by the infant's state. Therefore, if the infant is sleeping at the beginning of the session, then the NBO begins with the administration and discussion of the habituation items. If, however, the infant is crying, then the session begins with the soothability item, as befits the infant's state. In general, the administration is shaped by a number of factors, including the robustness or frailty of the infant, the focus or concerns of the parents, and the goals and the purpose of the NBO session itself. Most important, the parents' participation is central to the administration of the NBO. Their own previous observations of their infant's behavior, such as crying or soothing experiences, and their interpretation of these behaviors all inform and shape the direction of the session. Parents can be invited to administer parts of the NBO, such as eliciting the infant's response to the parents' voices or soothability, as a way of drawing parents further into the center of the interaction. The following are the NBO items:

Introduction and observation of infant state with parents

1. Habituation to light (flashlight)
2. Habituation to sound (rattle)

Uncover and undress (optional)

3. Muscle tone: legs and arms
4. Rooting
5. Sucking
6. Hand grasp
7. Shoulder and neck tone (pull-to-sit)
8. Crawling response
9. Response to face and voice
10. Visual response (to face)
11. Orientation to voice
12. Orientation to sound (rattle)
13. Visual tracking (red ball)
14. Crying
15. Soothability
16. State regulation
17. Response to stress (color changes, tremors, and startles)
18. Activity level

Although these 18 observations make up the full set of NBO observations, it should be pointed out that some of them are summary observations, such as crying, state regulation, response to stress (color change, startles, and tremors), and activity level.

In sum, the NBO can be described as an individualized, infant-focused, family-centered observational system that is designed for use by practitioners to elicit and describe the infant's competencies and individuality, with the explicit goal of strengthening the relationship between the parent and the child and promoting the development of a supportive relationship between the clinician and the family.

## UNDERLYING THEORETICAL ASSUMPTIONS

The theoretical assumptions underlying the NBO, which will be expanded and elaborated on throughout this volume, provide the clinician with a framework within which to understand newborn and infant behavior and development, on the one hand, and parent and family development, on the other, so that he or she can use the NBO in a way that is individualized, theoretically robust, and developmentally sound. Here, we will summarize some of the key theoretical principles on which the NBO is based.

### The Competent Infant

The NBO is based on the assumption that newborns come into the world with a wide array of mental skills and predispositions and a set of abilities that are uniquely suited to the critical needs of early life. Recent research has yielded an extensive taxonomy of newborn and infant behavior. The newborn infant not only can see but also has clear-cut visual preferences, as Fantz (1961) pointed out many years ago. Fantz reported that infants preferred to look at visual patterns that they had never seen before in contrast to patterns that they had seen. This has been confirmed by a number of more recent studies demonstrating that newborns can focus and visually track stimuli (Dannemiller & Freedland, 1991; Laplante, Orr, Neville, Vorkapich, & Sasso, 1996; Slater, Morison, Town, & Rose, 1985). Newborns have certain scanning preferences and are sensitive to eye gaze from the beginning. Not only can newborns track visually, but they also prefer the mother's face and can even discriminate their mother's face from that of a stranger (Pascalis, de Schonen, Morton, Deruelle, & Fabre-Grenet, 1995).

It therefore is clear that biology has programmed the human newborn to be a prosocial organism that actively seeks contact with the social and physical world, and the biological competencies at birth guarantee that the infant is able to interact with the physical and social environment. Newborns not only can distinguish between contrasting physical patterns but also are able to explore the internal features of the face and to gather cues about the partner's emotions (Blass & Camp, 2003; Trevarthen, 1993). Newborn infants seem to prefer the human face over all



other stimuli, and are sensitive to eye gaze from the beginning. Farroni, Massaccesi, Pividori, and Johnson (2004), for example, showed that newborns looked significantly more at a face with direct gaze than at a face with averted gaze. The infant's gaze behavior not only regulates his or her internal physiological state but also signals his or her readiness to engage in communication. The infant's visual system, therefore, serves to elicit a dyadic form of interchange, which helps a parent recognize that the infant indeed is a fully responsive human being—a person with an individual personality.

In terms of sensitivity to the interpersonal context of their new world, there is evidence that infants are able to discriminate between different affective facial expressions (e.g., happy, sad, surprised) and even are capable of imitating these expressions (Field, Woodson, Greenberg, & Cohen, 1982). Indeed, newborns can imitate both in the visual and auditory modalities, which include not only mouth, tongue, and other facial movements but also eye blinking and sequential finger movements (Meltzoff & Moore, 1999). An equally important finding for the clinician who uses the NBO is the discovery by Als in her work with the Assessment of Preterm Infant Behavior and the current authors' work with the NBAS that gaze aversion suggests the need to withdraw from an overly demanding situation or the need to recover from the excitement of the interaction (Als, 1982, 1986; Brazelton et al., 1974; Brazelton & Nugent, 1995). The NBO is based on the assumption, therefore, that the main task or challenge that the newborn faces is to organize and integrate the new world of sights, sounds, faces, and voices in a way that is both understandable and predictable. In other words, the newborn seems to come into the world with a set of social capabilities that enable him or her to read and decipher the emotional expressions of the caregiver as well as to interact with the caregiver, playing a vital role in the development of the parent–infant bond (Klaus, Kennell, & Klaus, 1995).

The newborn also can hear and locate sounds (Muir & Field, 1979) and seems to prefer higher pitched voices or, more specifically, the mother's voice (Clarkson & Clifton, 1995; deCasper & Fifer, 1980; deCasper & Spence, 1991; Ecklund-Flores & Turkewitz, 1996; Fifer, 1993; Fifer & Moon, 1994; Moon, Cooper, & Fifer 1993; Morrongiello, Fenwick, Hillier, & Chance, 2004; Querleu, Renard, Boutteville, & Crepin, 1989; Spence & Freeman, 1996). Indeed, newborns can detect the overall patterns of rhythm and pitch that differentiate one person's voice from another's and can discriminate between languages (Nazzi, Floccia, & Bertoncini, 1998). There even is evidence to suggest that newborns can discriminate between two vowels (Moon et al., 1993) and between unfamiliar whispered voices (Spence & Freeman, 1996). Newborns can remember speech sounds (Swain, Zelazo, & Clifton, 1993) and specific musical sounds (Hepper, 1991). Newborns also seem to be able to detect the sounds of *any* language and can make fine-grained distinctions between many speech sounds (e.g., “ba” and “ga,” “ma” and “na”) and show a greater sensitivity to low-frequency sounds as compared with adults, who

show maximum sensitivity to high frequencies (Aldridge, Stillman, & Bower, 2001). It is their adaptive value that renders these remarkable capacities so important to the newborn because, taken together, they serve one of the major developmental functions of the infancy period, namely, the promotion of mother–infant attachment.

Although infants have very specific visual and auditory capabilities, it is evident that they are competent in all five sensory modalities. Review of the evidence for the other newborn senses reveals that the newborn already has a sophisticated sense of smell and can distinguish the smell of the mother from that of a stranger. Taste, too, is well developed, and infants not only prefer sweet solutions over salty or bitter-tasting solutions but also prefer some types of sweet tastes over others. Newborn infants also are sensitive to touch. Touch is a fundamental means of interaction between parents and infants, and a substantial body of research demonstrates the positive effects of gentle stroking on the infant's behavioral development and on the parent–infant relationship itself (Field et al., 1986; Scafidi, Field, & Schanberg, 1993).

Infants are born with an array of reflexes and motor behaviors such as rooting, sucking, crawling, and muscle tone, all of which are included in the NBO. Although most newborn reflexes disappear during the first 6 months of life as a result of the increase in voluntary control over behavior as the cerebral cortex develops, many of the newborn reflexes such as rooting and sucking have clear-cut adaptive value for the neonate and serious implications for caregiving. The rooting reflex, which propels the infant to search for the mother's nipple, is displayed when the infant is hungry or when the cheek area is lightly stroked (Rochat & Hespos, 1997). Moreover, although the sucking reflex is involuntary, there is evidence to show that infants do have control over their sucking and can adjust their sucking pressure in response to the flow of the milk from the nipple (Craig & Lee, 1999). Indeed, research has demonstrated that newborns can learn to adjust their level of sucking to produce interesting sights or sounds. For example, newborns suck faster to be able to see visual designs or hear music and human voices (Floccia, Christophe, & Bertocini, 1997). As Als pointed out, from a bioevolutionary perspective, newborn infants can be said to be perfectly designed to elicit from their new environment all the support they need for their survival and successful adaptation (Als, 1986).

That newborns can see and hear, have a refined sense of smell and touch, can shut out specific environmental noise, and have a number of highly adaptive reflexes is an impressive range of behavioral capabilities. As impressive as these competencies are, though, they can only hint at the very complexity of the newborn's overall behavioral organization. How these remarkable competencies are activated and integrated by the infant to respond to and make sense of his or her new world is one of the core questions that the NBO poses. It is the infant's capacity for organization—the degree to which he or she organizes these behaviors and the attempts

to self-regulate—that are the focus of the NBO. For that reason, it should be pointed out that it is not the aim of the NBO to demonstrate, *show off*, or highlight discrete capacities, such as the infant's ability to turn to the sound of a rattle or track a red ball. The focus, rather, is on the overall quality of self-regulation and organization. The NBO yields a comprehensive profile of the newborn in terms of the level of behavioral organization and areas of disorganization or areas in which the infant needs environmental support. The NBO is used to help parents understand the integrative capacities of the newborn, how the newborn infant can produce organized response to his environment, and how much and which kind of support the newborn needs to reach this level of organization. Although describing the newborn's competencies is validating for parents, identifying the areas in which the infant needs environmental support, and arriving at the kinds of facilitation or scaffolding that the infant may need, make for a more balanced behavioral profile.

### Behavioral States

The first and perhaps the most obvious example of the newborn's capacity for organized behavior is the existence of predictable behavioral states. The concept of behavioral state is central to understanding the newborn and is, perhaps, the single most important concept that has contributed to current understanding of the newborn. Behavioral states can be defined as recurrent ensembles of behavior that have similar characteristics (Brazelton, 1973; Prechtl & Beintema, 1964; Wolff, 1959). These behaviors tend to co-occur and can be observed and identified reliably. There are six behavioral states:

1. Deep sleep (non-REM sleep): regular breathing, eyes closed, no spontaneous movement, no rapid eye movement; startles may appear
2. Light sleep (REM sleep): eyes closed, irregular respirations, more modulated motor activity; rapid eye movements are present
3. Drowsy or semi-alert: eyes may be open or closed; activity levels are variable
4. Quiet alert: alert with bright look; minimal motor activity
5. Active alert: eyes open; considerable motor activity; fussing may or may not be present
6. Crying

These behavioral states demonstrate that the newborn is not at the mercy of his or her environment and that the behavior of the newborn has an inherent organizational structure. Moreover, the NBO can demonstrate that the newborn infant has predictable, even unique, behavioral patterns. This has led to the understanding that *state* is a critical matrix on which to assess all reactions, sensory as well as motor, in the newborn (Brazelton, 1973). In addition, state is a powerful concept

that helps parents to understand their infant's behavior, the appropriateness of their handling techniques, and the quality of the stimulation that they can provide to meet the needs of their infant. This discovery led to the important clinical principle that the newborn's behavioral states inevitably influence the quality of the newborn infant's responses. The concept of *behavioral states* provides the clinician and the parents with a frame, or a lens, to enable them to organize their own observations about the infant and to learn to read the infant's behavioral cues.

The body of research described previously has yielded an impressive catalogue of newborn competencies that have transformed scientific understanding of the human newborn. This understanding also has enabled a new generation of clinicians to help parents recognize that their newborn infants can see and hear and are capable of organized responses and thus to support the development of the relationship between the parent and the infant from the beginning (Klaus et al., 1995; Nugent & Brazelton, 2000). Understanding the newborn's more complex organizational capacities and the ability to describe and recognize the developmental agenda and adaptive challenges for both term and preterm infants during the first months of life is critical in informing the clinical approach to working with parents. In this way, clinicians can provide developmentally appropriate information and individualized guidance to parents during this important life transition.

### The Newborn Period and the Development of Self-Regulation

The first 3 months of life can be called a period of rapid developmental transition, as the infant's behavior and physiology shift from intrauterine to extrauterine regulation. The developmental agenda now centers on the regulation of the infant's states (Brazelton, 1992; Emde & Robinson, 1979; Mirmiran & Lunshof, 1996; Sander, Stechler, Burns, & Lee, 1979). This period is characterized by changes that are pervasive and enduring and involves major reorientations in person–environment relations (Emde & Robinson, 1979, 1987). There also is evidence that this is a special period of developmental change and reorganization in the patterns of infant attention and emotion (Lavelli & Fogel, 2005). Although there is a wide range of variability, simple attention during the first month seems to dominate face-to-face interactions, whereas during the second month, infants show a wide range of facial expressions and emotional responses, from interest to concentration to astonishment and pleasure. From the fourth through the sixth week of life, the earlier simple gaze now is accompanied by more active positive emotional expressions, by expressions of effortful concentration, and by smiling and often motor excitement. By the third month, the duration of smiles and cooing increases as smiles become more open and cooing more playful. This more active pattern of attention is accompanied by excited attention during face-to-face interactions. Clearly, the infant's response to the parent's face is emotional, so gaze/attention is not merely neutral or cognitive.

The scope of the NBO extends across this period and is designed to describe the infant's adaptation and development, specifically the capacity for self-regula-

tion during that period. The task of self-regulation must be negotiated successfully before the infant can maintain prolonged moments of mutual gaze with his or her caregiver and develop the capacity for shared mutual engagement that constitutes the major task of the next stage of development (Adamson, 1996; Brazelton, Koslowski, & Main, 1974; Stern, 1995; Tronick, 2003).

It has been hypothesized that the newborn infant faces a series of hierarchically organized developmental challenges as he attempts to adapt to his new, extrauterine world, both the inanimate and the animate. Although these challenges or substages may not develop in an absolute sequence (and may be contemporaneous), there is an assumption of a hierarchical progression, such that each precedes the next. This includes the infant's capacity first to regulate his physiological or autonomic system, and then his motor behavior, his state behavior, and finally his affective interactive behavior, which develop in a stage-like epigenetic progression during the first months of life. From this developmental perspective, the NBO, when used serially during the first 3 months of life, enables the clinician to systematically study behavioral changes over time by describing the process of hierarchical integration of the different domains or systems of behavior.

The first and basic developmental task for the newborn is to organize his autonomic or physiological behavior. This involves dealing with stress related to homeostatic adjustments of the central nervous system. It involves the tasks of stabilizing breathing, reducing the number of startles and tremors, and being able to maintain temperature control. In the NBO, this is monitored by observation of the infant's startles, tremors, lability of skin color, and regularity of respiratory patterns.

When this homeostatic adjustment has been achieved, the newborn can move on to the second task: regulating or controlling motor behavior. This means gaining control over and inhibiting random motor movements, developing well-modulated muscle tone, and reducing excessive motor activity. The NBO facilitates observation of tone in the arms and legs; activity levels; and reflexes such as rooting and sucking, hand grasp, and crawl.

The third developmental task of this period is state regulation or organization of state. This is the ability to modulate behavioral states and includes the ability to develop robust and predictable sleep and wake states and what could be called sleep protection, or the ability to screen out negative stimuli while asleep. State control means that the infant is able to deal with stress, either through self-regulation strategies such as hand-to-mouth maneuvers or through communication with the caregiver by crying and thus being consoled with the caregiver's help. The NBO facilitates observation of the infant's capacity to habituate to light and noise stimuli while asleep and recording of the infant's state organization. Also observed are the amount of crying and the infant's capacity for soothability as indicators of his level of self-regulation.

The final developmental task for the newborn is the regulation of attentional-interactive, or social, behavior. This involves the capacity to maintain prolonged

alert periods, the ability to attend to visual and auditory stimuli within his range, and the ability to seek out and engage in social interaction with the caregiver. During the NBO, the infant's responses to the human face and voice as well as to inanimate visual and auditory stimuli are observed.

In summary, the NBO can reveal where along this hierarchical continuum the individual infant falls, in which domain he or she needs support, and the kind of support that he or she may need. Nevertheless, this developmental agenda and the infant's capacity to protect sleep and develop predictable sleep–wake states, cope with stress, and respond to his or her environment can be achieved only with the support of the caregiver. The NBO is designed, therefore, to help the clinician and the caregiver identify where the infant needs support and how they can provide this support. Management of crying, feeding, and sleep, for example, are some of the most overwhelming concerns of parents in these early months (Anders, Halpern, & Hua, 1992; Barr, 1990; Brazelton, 1962; Papousek, 1998; Wolke, Gray, & Meyer, 1994), so the NBO can be used as a tool to provide parents guidance on the most appropriate ways to manage sleep, feeding, and crying behavior in a way that is responsive to the individual infant's needs (these are discussed in greater detail throughout the book).

### Synapse Formation in the Newborn Period

There is growing evidence to suggest that the newborn period and the first months constitute a major stage in the infant's adaptation to his or her new environment and marks an important transition period in the infant's behavioral development (Barr, 1998; Dobbing, 1990; Lavelli & Fogel, 2005; Rochat, 1998), but it also involves a major transformation in many neural functions (Als et al., 2004; Hopkins, 1998; Huppi et al., 1998; Rakic, 1995). New research on brain development indicates that whereas the infant's nervous system will mature in a programmed sequence as higher brain areas progressively take control of the newborn's mental life, the newborn infant's brain at birth is fully developed to ensure that the infant can survive. Although synapse formation begins in the cortex as early as 7 weeks' gestation, it continues through gestation and the newborn period and into the second year of life and beyond. This is defined as a sensitive period, a period of rapid brain development, a period when the brain seems to act like a sponge, taking in new information quickly and easily. However, it also is known that although genes program the sequence of neural development in infants, it is the quality of the infant's unique caregiving environment that shapes this development. Genes control the timing of myelination, whereas environmental factors, such as the kind of stimulation to which the infant is exposed, will affect positively or adversely the thickness of the wrapping around the individual axons.

What is important for the clinician to realize, therefore, is that all of the essential refinements of brain wiring—dendritic growth, synapse selection, and even



myelination—are influenced by a child’s early experiences (Huttenlocher, 2002). Everything the infant sees, touches, hears, feels, tastes, and thinks translates into electrical activity in just a subset of synapses, tipping the balance for long-term survival. Synapses that rarely are activated, whether because of the absence of appropriate parent–infant interaction, crying that never is relieved, smiles that never are reciprocated, or expressions that never are exchanged, will wither and die (Eliot, 1999). Once a given brain region has passed the refinement stage, its critical period has ended, and the opportunity to rewire it has been significantly limited. Therefore, the critical period for basic sensory abilities, such as vision and hearing, end much earlier than those for more complex skills such as language and emotion whose neural circuits prune their synapses and myelinate their axons during most of childhood. This critical period of brain development presents a window of opportunity during which experience will play a key role in shaping a child’s mental skills.

### The Newborn Period as Formative in the Transition to Parenthood

From the parents’ perspective, these first months can be considered a normative crisis, a period that is characterized by rapid change as they attempt to establish a relationship with their new infant (Cowan & Cowan, 1995, 2000; Klaus et al., 1995; Winnicott, 1975) and search for the *goodness of fit* between themselves and their infant (Thomas & Chess, 1977). In the case of mothers, Stern (1995) referred to this unique but normal psychological condition as the *motherhood constellation*, a condition or stage that every mother experiences. With the birth of an infant, a mother passes into a new and unique psychic organization, which will determine “a new set of action tendencies, sensibilities, fantasies, fears and wishes” (Stern, 1995, p. 171). Although the clinician who administers the NBO draws on the infant’s behavior as the key informant in this intervention, he or she also must be aware of the challenges that parents are facing at this time if he or she is to enter into an empathic relationship and develop a therapeutic alliance with the parents.

This normative stage in the transition to parenthood therefore has its own protoclinical challenges, the resolution of which will have an impact on the ontogeny of the parent–child relationship, a stage that potentially is conducive to change in the parent’s own life development. Winnicott (1975) has suggested that this is a period during which a mother has a heightened sensitivity to her infant, which he calls “primary maternal preoccupation,” and that this sensitization is a necessary state to enable the new mother to “feel herself into her infant’s place, and so meet the infant’s needs.” The core challenge for the new mother therefore is to engage her infant in such a way that “fosters the baby’s development in a way that is authentic to her” (Stern, 1995, p. 173). This involves her ability to nurture and care for her infant, to help her infant to grow and thrive physically, to become attached, and to provide a secure environment for her in-

fant. Fathers also face many of the same psychological challenges in their own transition to parenthood, as Birss points out in Chapter 2. Although there is a wide range of cultural variation in the role that fathers and other caregivers play in this early stage, it should be pointed out that in most societies, both partners have a unique role to play in the socialization process of the young infant (Nugent, Yogman, Lester, & Hoffmann, 1988; Parke & Buriel, 1998). Because it is family-centered, the NBO offers the clinician a unique opportunity to enter into a supportive partnership with parents at a time when they may feel vulnerable and in need of support.

### The Development of the Parent–Child Relationship in the Newborn Period and the First Months of Life

These early months also constitute a major transition stage in the development of the parent–infant relationship (Beckwith, 2000; Beckwith, Cohen, & Hamilton, 1999; Brazelton, 1992; Cowan & Cowan, 2000; Emde & Robinson, 1979; Greenspan, 1992; Konner, 1998; Sander et al., 1979; Stern, 1995; Trevarthen, 1979; Trevarthen, Kokkinaki, & Fiamenghi, 1999; Tronick, 2003). At this stage, the earliest patterns of interaction are taking shape, as infant and parent are in a heightened state of readiness to exchange their first communication signals in their efforts to achieve a mutually satisfying level of affective mutual regulation—what Stern (1985) referred to as *affective attunement*. During the first months of life, the infant develops the capacity for shared attentiveness (Adamson, 1996), so both parents and infant have already embarked on and are actively engaged in an interactive regulative system (Sander et al., 1979).

It is during this time that parents' perceptions of the infant begin to consolidate (Brazelton, 1982; Bruschweiler-Stern, 1997; Cramer, 1987; Stern, 1995; Zeanah et al., 1997). Although parents begin to develop perceptions of their infants during pregnancy by translating fetal movement patterns in behavioral terms such as, "She's very active," or, "He is so good," or, "She is very angry with me," it is only in the newborn period that they can test these attributions in the light of the child's observable patterns of behavior. The NBO can help parents develop realistic perceptions of their infants and help them to modify their prenatal perceptions in response to their infant's objectively observed behavior patterns. Cramer (1987) maintained that parents' perceptions of infant behavior play a crucial role in determining the unfolding of the parent–infant relationship.

Many parents may tend to have unrealistic perceptions of their newborns, although Freedman (1980), Hinde (1976), and Kaye (1982) argued that a certain amount of *adultomorphism*, or overestimation of the infant's capacities (e.g., "She has a mind of her own," "He understands everything I say") can be adaptive in that it motivates parents in their attempts to communicate with their infants with the expectation of engaging in reciprocal interaction. Conversely, negative attribu-

tions such as, “He doesn’t seem to like me,” or, “Every time I look at her, she looks away,” present important clinical information to the clinician and may suggest that the parent–infant dyad could be at risk for future interactive disturbances.

Stern’s (1995), Cramer’s (1987), and Bruschweiler-Stern’s (1997) work clearly indicated that the task of influencing parents’ perceptions of their infant is complex because the meanings that parents attribute to their infant’s behavior may have their origin in the parents’ personal history and unconscious. Although the resolution of such distorted perceptions may be prolonged and painstaking, the NBO intervention can begin to contribute to the resolution of such perceptions by enabling parents to observe their infants’ own unique behavioral makeup and the infants’ own interaction capacities, thereby helping to prevent the development of noncontingent interaction patterns. (Chapter 2 presents a more comprehensive treatment of the meaning attribution process in parent–infant relations.) Fraiberg et al. (1980) illustrated this in her work on “ghosts in the nursery,” in which she demonstrated how conflicts from earlier relationships may intrude on and interfere with the parents’ current relationship with their infant. For example, a child may become a replacement for a deceased or lost object such that the parent is reacting to an imaginary child and not to the real infant before him or her. According to Fraiberg, parents often repeat with their infants their own childhood traumas “in terrible and exacting detail” (1980, p. 165). The result of such distorted perceptions may lead to what Stern (1985) referred to as *parental misattunements*, and it is proposed here that the NBO can be used to prevent this from happening.

The NBO is designed, therefore, to help the clinician and the caregiver, together, to identify where the infant needs support and how they can provide this support. Management of crying and sleep, for example, are two of the most overwhelming concerns of parents in these early months (Anders et al., 1992; Barr, 1990; Brazelton, 1962; Wolke et al., 1994). The NBO can be used as a tool to provide guidance to parents on the most appropriate ways to manage sleep and crying behavior in a way that is responsive to the individual infant’s needs and enhances the parent quality of parent–infant interaction. From an interventionist point of view, it has become clear that this transition period provides the clinician with a remarkable opportunity to play a supportive role in promoting the infant’s self-regulation on the one hand and facilitating the mutual affective regulation process between the parent and the infant on the other hand. Moreover, the quality of the clinician’s relationship with parents is crucial because it is intended to have a transforming effect on the parents’ relationship with their child.

## A Major Transition in Family Functioning

The early months are unique in that this period constitutes a critical transition point in the evolution of the family as a system (Cowan & Cowan, 2000; Minuchin,

1985; Stern, 1995). The entry of an infant into an already functioning system inevitably changes the dynamics of family functioning because the period after birth involves a vital redefinition of roles (Belsky, 1985; Cowan & Cowan, 2000; Minuchin, 1985). Indeed, it can be added that these profound life changes also are ecological transitions, as Garbarino (1992), Bronfenbrenner (2002), and Lerner, Rothbaum, Boulos, and Castellino (2002) pointed out, in that the birth of a child will irrevocably influence the family system and the wider circle of systems, including the family and the community, which potentially will influence the course of the new infant's future development.

The task of the family system is to accommodate the new member while maintaining a viable relationship among its elements and with its environment. The task of the clinician, then, is to help the family to maintain stability within its system and at the same time enable it to be flexible enough to adapt to and accommodate a new element into an already existing, integrated system. After birth, all family members—mothers, fathers, siblings, and grandparents—have to adjust to the presence of the new family member and to renegotiate their relationships and roles (Nugent, 1991). The NBO can facilitate this major developmental process by helping parents to understand the differential effects of the infant on the family and how the infant's behavioral makeup may influence family roles and functioning. (See Als and Lawhon, 2004; Barnard, Morisset, and Speiker, 1993; Beal, 1986; Candilis-Huisman, 1997; Fabre-Grenet, 1997; Murray, 1994; Murray and Cooper, 1997; and Myers, 1982, for studies emphasizing the importance of helping parents understand the impact of the infant on family relationships.)

What is unique about the NBO approach as a form of intervention or parent support is that the infant—the infant's behavior—is at the center of the encounter with parents; it is through the infant that clinicians hope to motivate and support parents in their efforts to understand and respond to their infants. It is *infant focused* because it yields a profile of the infant's behavioral repertoire or temperament and describes the behavioral adaptation of the infant from birth to the third month of life. It also is characterized as *family centered* not only because it is always conducted in the presence of parents and family members but also because it is designed to engage the parents and sensitize them to their infant's communication cues to enhance the quality of parent–infant interaction and family functioning. To provide support that is individualized to the infant and the family, one of the primary goals of the NBO is to help the parents understand their infant's behavior to identify the kind of support and stimulation that the infant needs for his or her optimal development. Specifically, the NBO provides information on the infant's sleep behavior; feeding and motor behavior; threshold for stimulation, crying, and soothability; and social interactive behavior. The ultimate goal of the NBO, however, is to promote relationship building to help parents understand and respond to their newborn infant and at the same time to help the clinician develop a partnership with the parents around the infant's behavior.

## CLINICAL PRINCIPLES THAT GUIDE THE USE OF THE NBO

This chapter has presented data to suggest that the newborn period and the first 3 months undoubtedly are an important period of development, but in terms of the implications for clinicians, there also is the possibility that the first months of life may be *the intervention touchpoint* or *the teachable moment* par excellence, across the life span. A teachable moment is a point in the child's or the family's development when providing the kind of developmental information and emotional support that parents need may have long-lasting effects on the parent–infant relationship and on developmental outcome. Following is a series of clinical principles that are designed to guide the clinician in the appropriate use of the NBO.

### First Clinical Principle: The NBO Is a Relationship-Building System

The NBO is, in essence, a relationship-building instrument that can be used to sensitize parents to the capacities and the individuality of their newborn infant and to foster the relationship between parents and infants. Not conceptualized as an assessment, per se, or as a simple demonstration of the infant's capacities, the NBO aims to capture the infant's uniqueness or individuality with the goal of fostering the bond between parent and infant. It provides parents with an understanding of their infant's behavior, on the basis of the shared observations of the NBO. It creates a profile of the infant's behavioral repertoire and thereby enables the clinician to provide important information to parents about their infant and identify the kind of support and stimulation that the infant needs for his or her optimal development. Each behavior is described in terms of what it reveals about the infant's temperament or personality and its potential for guiding parents on how to respond to their infant.

The NBO assumes, then, that the newborn infant is a competent, social organism who is predisposed to interact with his or her caregiver from the beginning. It documents the newborn's contribution to the parent–infant system, so it can be described as an observation of the infant in a dynamic interactional environment, not as a simple observation of the infant in isolation. It was never conceptualized as a series of discrete stimulus–response presentations but rather as an interactive observation in which the clinician plays a major role in facilitating the organizational skills of the infant. In this way, the clinician–infant transactions during the NBO simulate the parent–infant relationship and provide a window into the infant's contribution to the emerging parent–infant relationship. This process is described in more detail in Chapter 4.

Providing parents with information on their child's development and offering caregiving guidance should be presented in the context of a relational model of family-centered care if it is to have a significant effect on child growth and development. Karl, Beal, and Rissmiller (1995), Becker, Palfrey and Wise (1998), and

Green and Palfrey (2000), for example, demonstrated that a close relationship between the family and the primary care clinician helped to improve the pattern of health care utilization by families who lived in disadvantaged areas. The hope, then, is that this positive, nurturing, nonjudgmental relational experience becomes gradually internalized and incorporated into the parents' own internal representation of themselves as parents and of their child. For parents who are feeling alone and vulnerable, the opportunity to develop a relationship with a clinician who is supportive and caring can be the first step in enhancing parents' sense of worth. This in turn is an important condition in helping parents become more positively invested in their child.

The NBO in the neonatal period, however, is thought to provide only one glimpse into the continuum of the infant's adjustment to labor, delivery, and a new environment. Repeated NBO observation sessions can best demonstrate the infant's coping capacities and capacities for using his or her own inner organization as he or she begins to integrate and profit developmentally from the environmental stimulation. Serial observations in either clinic or home settings would reflect better the interaction between the infant's inborn characteristics and the environmental influences during the first weeks of life. Moreover, this shared experience allows for the relationship between parents and clinicians to develop so that the clinician–parent relationship can become a reliable safe base for the new parents.

### Second Clinical Principle: The NBO Is Infant Focused

At the heart of the NBO is the infant's behavior. The NBO provides the infant with a *voice*, with an opportunity to reveal his or her own profile of behavior and temperament or behavioral style and thereby prevent the possibility of premature labeling on the basis of a priori medical or social background data. However, an assumption underlying the NBO approach is that the infant's temperament or behavioral profile is a co-construction of the parent, the clinician, and the infant. The infant's behavior never is objective information in the sense that it stands on its own and is self-explanatory. Although it may be interpreted by the clinician, the clinician must be aware then of the mother's psychic processes and should recognize that her representations of herself and her infant will shape her understanding of the infant's behavior during the session, as Bruschweiler-Stern (1997) and Birss (in Chapter 2) pointed out.

What is unique about the NBO approach, therefore, is that the infant—the infant's behavior—is at the center of this shared observation, and it is through the infant that clinicians hope to motivate and support parents in their efforts to respond to their infants. The NBO reveals the power of the infant to elicit from his caregiving environment the nurturing and caregiving that he needs for his successful adaptation. The infant therefore becomes the catalyst in intervention environments by providing a powerful motive for positive change in the parents. The



infant represents parents' hopes and deepest longings: "He stands for the renewal of the self; his birth can be experienced as a psychological rebirth for his parents" (Fraiberg et al., 1980, p. 54). All parents want the best for their child, so when the clinician shares this goal, the infant becomes the bond that unites the clinician and the parents in fulfilling their hopes for their infant. In this way, the positive adaptive tendencies that are inherent in the parent–infant relationship can be mobilized in the service of the infant's development.

The NBO reveals that the newborn is capable of communicating his needs, so the course of infant development depends to a great extent on the ability of the caregiver to read and respond to these communicative cues. The infant emerges both as being socialized and a socializer at the same time. It is a bidirectional process wherein the infant regulates, modulates, and refines the caregiver's behavior in the service of his or her own adaptation, and the caregiver in turn provides the scaffolding to help promote the infant's successful adaptation (Sander et al., 1979; Vygotsky, 1987). Several studies have examined the contribution of newborn behavior to parent–infant interactions and future developmental outcome (e.g., Crockenberg, 1981; Lester, 1984a; Linn & Horowitz, 1984; Murray & Cooper, 1997; Van den Boom, 1991, 1994, 1995; Waters, Vaughn, & Egeland, 1980).

In the context of the NBO, the infant becomes the key informant, and the clinician accepts whatever level of information or participation parents offer, at the pace at which they offer it. The NBO approach underscores the importance of respecting parents' defenses by neither directly eliciting clinical material nor pre-termining the nature and the extent of parents' involvement at this time of transition in their lives. By following this approach, parents' degree of involvement and participation in the intervention tend to increase during the course of the interventions during the first months of life (Nugent, Hoffman, Barrett, Censullo, & Brazelton, 1987). By the third month, the parents and the clinician will have come to know the infant more as an individual because they have observed the infant's development during that period. By that time, the clinician in turn hopes to have laid the foundation for an enduring, supportive relationship with the family that will continue to grow as the neonate moves into infancy.

### **Third Clinical Principle: The NBO Is an Individualized Development-Based System**

Whereas the NBO can be carried out in many ways and may take different forms depending on the clinical environment, it is the capacity of this set of observations to bring out the individuality or the temperament of each infant that may constitute its effectiveness as a form of intervention. It is the individualized nature of the NBO that renders it responsive to the particular needs of individual infants and families. For this reason, it has been suggested that through the NBO session, although parents learn new information about their newborn's capacities, what is more important is the ability of the NBO to reveal the infant's unique traits or style

of adaptation or temperament. This new knowledge in turn better enables parents to understand and respond to their infant as a unique individual and to learn the infant's communication cues.

The newborn's temperament emerges out of his or her engagement with these developmental challenges and his or her emotional response to the new environment. Demonstrating and identifying the child's behavioral style or temperament affects both the way parents feel about themselves and the way they function as parents (Carey, 1999; Carey & McDevitt, 1995). Carey and McDevitt pointed out that the newborn period is an optimal time to help parents understand their infant's cues. This can be done through the kind of shared behavioral observation with parents that the NBO offers.

The NBO does not describe what infants can do or even how they do it in generic terms. When clinicians introduce the NBO to parents, they do not say, "Did you know that infants can see and can even track a red ball?" or "Did you know that infants recognize their mother's voice?" Rather, they can say, "Let's see how your infant responds to what we present to her." The goal of the NBO is to personalize the infant for the parents by describing the infant in terms of the kinds of characteristics that make him or her unique. By focusing on the *how* of the infant's responses—the process rather than the product—the focus is shifted from what he or she does or does not do to what makes this infant unique. In this way, the infant's behavioral profile on the NBO becomes his or her behavioral signature.

By eliciting, describing, and interpreting the newborn's behavior, the clinician has an opportunity to participate with parents in identifying the kinds of demands that the infant will make on his or her environment and the kinds of caregiving techniques that best can promote the infant's organization and development. The NBO thus offers the clinician and the parent a forum to observe the infant's level of functioning during the first months and together arrive at a behavioral profile that captures the infant's individuality and temperament. Although the immediate goal of the NBO may be to help reveal to parents the infant's unique adaptive and coping capacities, the long-term clinical goal is to influence the infant-parent relationship positively by developing a supportive therapeutic alliance with the family at what could be called *the* formative moment in the development of the family system. The NBO thus is seen as the first stage in the development of a supportive relationship between the clinician and the parents that should continue beyond the newborn period.

#### **Fourth Clinical Principle: The NBO Is a Family-Centered System**

With the birth of an infant, the family becomes an open system. This means that the pediatric clinician has a unique opportunity to enter into and become an integral part of the family support system. In high-risk environments, this entry point can provide the clinician with a unique opportunity to support the family and thereby counterbalance the risk that is present within the microsystem itself

(Garbarino, 1982, 1992; Klaus et al., 1995; Lerner et al., 2002). Barr (1990) argued, for example, that infant behaviors such as excessive crying or early sleep problems can create tension among family members and have a negative effect on family functioning. They can lead to the development of parents' negative perceptions of their infant, and can in turn undermine parents' confidence in their ability to parent. The NBO can be used to address this issue within the context of the family.

With single-parent families or families who feel isolated or have no support system, the NBO can be used by the clinician to serve as a bridge between the family and the broader community and increase the availability of informal community support for the family on the one hand and more formal family resource services and early intervention in the community on the other hand (e.g., Hauser-Cram, 2006; Mahoney & Perales, 2005; Meisels, Dichtelmiller, & Fong-Ruey, 1993; Sameroff & Fiese, 2000; Shonkoff & Meisels, 2000; Weissbourd & Kagan, 1989; Wolke et al., 1994). This can best be achieved by a long-term partnership between the clinician and the family, as illustrated by the Touchpoints model, which is based on the assumption that helping parents identify and expect bursts and regressions in child behavior (the "touchpoints") can reduce parental frustration and self-doubt while fostering their parenting and enjoyment of their child (Brazelton, 1992, 1995; Stadtler, O'Brien, & Hornstein, 1995). The use of home visitors to provide this kind of support is especially common in Europe and in federally mandated early intervention programs in the United States, while certain innovative programs in North America involve grandparents (Crockenberg, 1986), foster grandparents' making home visits to isolated young mothers during these first months (Anisfield & Pinkus, 1978), or peer-support groups (Boger & Kurnetz, 1985). (See Sweet and Applebaum, 2004, for a meta-analytic review of home-visiting programs for families with young children.) The NBO is being increasingly used in early intervention environments from birth to the third month as part of the weekly home-visiting program, where the findings are integrated into the individualized family service plan (IFSP; Levine, 2006). In such environments, the NBO-based intervention sessions not only can serve to strengthen the relationship of the clinician and the family but also can be used to strengthen the relationship between the family and community support systems.

### **Fifth Clinical Principle: The NBO Is Based on a Positive-Adaptive Model**

For entering into a partnership with the parents, using a model that is positive-adaptive rather than pathological is proposed (Brazelton, 1982). This positive approach may be particularly difficult for some mental health clinicians, as Cramer (1987) pointed out, because of the nonadaptive bias of the psychoanalytically inspired intervention models. This is reflected in the persistence of the notion of the young infant as helpless and in the emphasis on the parents as the solitary contributors to the infant's development.

Although the NBO philosophy is built on the recognition and appreciation of the integrative capacities of newborn infants, this positive-adaptive approach in turn is extended to respect and acknowledgment of the caregivers' abilities to meet the needs of their young infant. The recognition of parents' capacities for nurturing is reinforced by a series of microanalytic analyses of early parent–infant interactions that were conducted at the Child Development Unit at Children's Hospital, Boston (Brazelton et al., 1974; Lester, Hoffman, & Brazelton, 1985; Tronick, Als, & Brazelton, 1980; Weinberg, Olson, Beeghly, & Tronick, 2006; Weinberg & Tronick, 1996). These data demonstrate that the social stimulation provided by caregivers is rich, multimodal, and reciprocal. Papousek and Papousek (1987, 2002) assigned these behaviors the position of intuitive behaviors because they seem to assume an intermediate position between categories of innate reflexes and responses that require rational decisions. The idea that human parental behaviors may be selected during evolution and that parents have endogenous parenting capacities demands that clinicians who work with parents have a respectful, nondidactic, and nonjudgmental attitude toward parents. Belsky's (1985) reanalysis of his previous data and the authors' own work with infants who are small for gestational age and their families (Nugent et al., 1987) suggested that the efficacy of behavior-based interventions is mediated by parental involvement and interest and lies as much in the quality of the clinician–parent relationship as it does in the demonstration of newborn behavioral capacities.

The quality of the clinician's relationship with parents is crucial because it is intended to have a transforming effect on the parents' relationship with their child. The parameters of respect, concern, accommodation, and basic positive regard become crucial as the envelope of the entire *treatment* process. The more concerned or anxious the parent is, the more crucial this reliable emotional context becomes. Although the nature of the relationship will change over time, the quality of respect and mutuality must remain to withstand the unanticipated problems that inevitably occur. This aspect of the parent–clinician relationship can provide parents with what Lieberman (1991) referred to as a “corrective attachment figure” that contrasts with the criticisms that they may be experiencing from other sources in their lives. By valuing the parents' attempts to reach out and understand their child, the clinician provides the parents with an experience and a model of a more nurturing and supportive relationship.

### **Sixth Clinical Principle: The NBO Promotes the Development of a Positive Clinician–Family Partnership**

The establishment of a relationship of trust between the clinician and the family is the cornerstone of the development of a therapeutic alliance, as Greenspan (1981), Harrison (1993), Stern (1995), and Stewart (1995) pointed out. The infant-focused nature of the NBO-based intervention is well suited to developing a partnership with parents. This infant-focused intervention, in contrast with an exclu-

sively parent-centered, verbally mediated approach to intervention, may be particularly effective in working with families in the newborn period.

The clinician's predominant attitude toward parents, therefore, is both respectful and nonjudgmental. The clinician must be able to listen empathically to parents' questions and observations (Boukydis, 1986; Cowan & Cowan, 2000; Heinicke, Feinman, Ponce, Guthrie, & Rodning, 1999; Hirschberg, 1993; McDonough, 1993). In Cramer's (1987) view, paying attention to a mother's verbal reports and what she thinks about her infant is crucial, because these attributes play a significant role in determining the unfolding of the mother–infant relationship. The NBO environment should always provide parents with an opportunity to share their perceptions of their infant and to relate their experience of becoming a parent, in what Zeanah and McDonough (1989) referred to as the *family story*.

In high-risk environments where families are under stress, however, parents may be unable to respond contingently to their newborn's eliciting behaviors. When there is maternal depression or when parents are affectively unresponsive or unavailable, interactive disturbances may occur (Field, 1987; Murray, 1994; Murray & Cooper, 1997). However, results of a recent study on the effects of the NBO showed that parents who participated in the NBO were less likely to have postpartum depressive symptoms as compared with a matched group of first-time parents who did not participate in the NBO (Nugent, Valim, Killough, Gonzalez, Wides, & Shih, 2006). Helping parents read their infant's cues or merely confirming the validity of their own observations and providing parents with feedback on how their infant responds to them can help mobilize confidence in their efforts to communicate with their young infant. During the NBO session, clinicians try to give parents an opportunity both to observe and to interact with their infant. Parents have a chance to elicit these behaviors from their own infant, and, in this way, they have an opportunity, with the facilitation and support of the clinician, to experience the sense of efficacy in eliciting these responses (Munck, 1985; Munck, Mirdal, & Marner, 1991).

### **Seventh Clinical Principle: The NBO Is Designed to Be Used to Bridge the Clinician–Family–Community Gap**

It must be recognized that the newborn infant enters into a social network that may be made up of parents, grandparents, siblings, and friends, all of whom can exercise a significant influence on the infant. Although the newborn period often provides the clinician with a unique opportunity to develop a relationship with the infant's father or mother, the effectiveness of the NBO session can benefit from the inclusion of the siblings, grandparents, or other important elements of the infant's social network, because they all need to adjust to the presence of the new family member (Cowan & Cowan, 2000; Lerner et al., 2002; Minuchin, 1985). Expanding the scope of the intervention to include a broader range of potentially

supportive allies is particularly important when working with families under stress, such as economically disadvantaged families, migrant families, single-parent families, adolescent parents, families with preterm infants or infants who are small for gestational age, or families with infants who are behaviorally irritable and difficult to handle (Nugent, Blanchard, & Stewart, 2007). In this way, the NBO can be used to try to bridge the gap between the family and the support networks within the community.

This means that the traditional transactional view of development with its emphasis on the bidirectional nature of parent–infant relations must be complemented by an understanding of the newborn as an active participant in a larger social network (Bronfenbrenner, 2002; Lerner et al., 2002). The application of systems theory to parent–infant relations demands that clinicians extend their focus from the mother–infant dyad to the family system to understand better the transforming effects of the infant on the family system and the effects of the various elements of the family system on the infant’s adaptation and development. Although the infant is necessarily at the center of this approach, the NBO is done best in a family context, which provides an opportunity to focus on the potential role of the infant in influencing mother, father, grandparents, neighbors, or whoever makes up the informal network of relatives or friends who have an investment in the growth and well-being of this new infant. The family and the entire network of family interactions becomes the focus of this approach in clinical environments. Although the infant and his behavior is the focus of the NBO session, it is the family that becomes what Stern referred to as the *port of entry* for the clinician (Stern, 1995).

From this systems perspective, the NBO approach attempts to assess the contribution of the new infant to family interactions and, at the same time, work with the family to learn what it has to do to incorporate this new element into their system. Using the NBO in such environments requires what Emde (1987) referred to as *systems sensitivity*, which he defined as “the empathic registration by the therapist of the quality of functioning of complex personality subsystems and their interactions” (p. 1314). Within the context of the NBO, this means that the clinician must be able to understand and assess ongoing interactions with the family system—between parent and infant as well as between the parents themselves.

The NBO intervention takes place at different levels, so for the clinician it requires an appreciation of the simultaneous operation of multiple systems within the intervention environment. At one level, the clinician is interacting with the infant as he or she attempts to assess the infant’s interaction capacities and potential influence on the parents’ caregiving. At another level, the clinician is interacting with the parents in an effort to develop a supportive and trusting relationship with them around their infant. The systems-sensitive clinician is equally aware that the quality of the parents’ own relationship and their extended family and community supports, their attitudes toward the infant, and their relationship with



the clinician all affect the emotional climate of the session and will play a role in influencing the outcome.

## SUMMARY

The period from birth to 3 months can be considered a major transition period in the newborn's adaptation and development and in the parents' own psychological development. It is a period that is defined by specific developmental challenges for both the infant and the parents as the newborn attempts to make a successful transition to his or her new, extrauterine environment and the parents attempt to respond to their infant's needs. What the NBO can teach is that this process is highly individualized and that there is a wide range of variability in how newborn infants adapt to their new environment during these first 3 months and how caregivers respond to their infants. It has become clear that this transition period provides the clinician with a remarkable opportunity to play a supportive role in promoting the infant's self-regulation on the one hand and facilitating the mutual affective regulation process between the parents and the infant on the other hand.

In sum, the NBO is an individualized, infant-focused, family-centered observational system that was designed to be used by pediatric practitioners to elicit and describe the infant's competencies and individuality, with the explicit goal of strengthening the relationship between the parents and the child and promoting the development of a supportive relationship between the clinician and the family. The NBO consists of a set of neurobehavioral observations that need to be interpreted or reframed in a way that enables parents to understand the meaning of the behavior and thereby support them in their efforts to get to know and become attached to their infant. Because it is short and designed to be flexible, it can be used by a wide range of professionals in a variety of clinical environments, both in-hospital and outpatient. It is important that clinicians understand the theoretical principles that inform its use and that they are able to interpret the observed behavior in terms of the infant's and the parents' developmental and caregiving agenda.