The holding environment as the context for intervention: A case study of two infants

J. SOPHIE THAYER[1] AND SUSAN C. HUPP[2]

1. *Department of Early Childhood/Elementary Teacher Education, Emporia State University <jthayer@emporia.edu>*
2. *Department of Educational Psychology, University of Minnesota.*

The role of the holding environment in the neonatal period is crucial in helping the infant and caregiver establish the patterns that help to ensure the infant's future development. Consistent and contingent responses by the nurturer to the infant's early cues are known to positively affect brain development. If those cues are misread or ignored, the infant's development may be in jeopardy. This article presents a report of the recovery curves of two infants who were developing in quite different caregiving environments. No prognosis is given for the infants' futures, but the questions raised by the course of their neonatal development illustrate the need for home visitors with expertise in infant mental health to help families create the proper holding environment for their newborns in the early weeks and months following birth.

Keywords: mother-infant interaction, attachment, infant mental health, Neonatal Behavioral Assessment Scale.

INTRODUCTION

Our knowledge of how the human brain develops has grown considerably since Morris Lipton (1976) described the axiom of the then new discipline of neurobiology: "The brain, as a living organ, is plastic and undergoes biological change with experiences that result in learning and memory" (p. 64). For the infant, these experiences take place primarily within the context of interactions with the primary caregiver. These interactions shape the structure of the brain (National Scientific Council on the Developing Child, 2004a; Siegel, 1999) and form the foundation for all future development (Winnicott, 1987). Neural pathways are created and activated by the experiences the infant has while interacting with the environment.

In the beginning, an infant's interactions with the environment are purely social/emotional. In order for these interactions to be optimal, the primary nurturer must be attuned to how the infant is feeling and match her behavior to the infant's (Brazelton & Cramer, 1990). The nurturer has to perceive the mind of the infant. Without this attunement the infant's signals can be misread and responded to in a way that leaves the infant feeling anxious (Brazelton, Kowalski, & Main, 1974). The nurturer's interactions need to be consistent with and contingent upon the infant's needs. This "primary maternal preoccupation" (Winnicott, 1987, p. 36), for the typical primary nurturer of infants in our culture is the mother, needs to be present in the first weeks and months following birth. The "holding" environment provided by the nurturer provides the infant's first experiences with extra uterine life (Winnicott, 1987, p. 96). When the infant experiences consistent, contingent responding by the nurturer, the reliability of the nurturer becomes a belief (Winnicott, 1987). This belief is of enormous importance in the developmental unfolding of the infant.

FOUNDATION OF THE HOLDING ENVIRONMENT

How, then, is this "holding" environment created? The process may, in fact, be influenced early by the mother's psychological adaptations to pregnancy and the emotional development that she experiences as she comes to accept, or not, the infant developing within her. The inter-relatedness of the mother and infant begins as soon as the mother realizes she is pregnant. Theorists have postulated that the pregnant woman undergoes a series of developmental crises or phases that, if successfully resolved, prepare her psychologically for motherhood (Bibring, Dwyer, Huntington, & Valenstein, 1961; Brazelton & Cramer, 1990; Winnicott, 1987). The first crisis is marked by feelings of ambiguity, which are usually resolved during the second phase, in which the fetus' movements convince the mother that the baby is real. The second phase marks the beginning of the "primary maternal preoccupation" (Winnicott, 1987, p. 36). In the third phase the mother begins to fantasize what the baby will be like.

Labor and delivery are the culmination of the anticipation of the infant. Both mother and infant must reorganize around the infant's extra uterine life (Benedek, 1949). Infants experience sensations that were not experienced *in utero* and learn to get their needs met by their primary nurturer. They also strive to maintain balance (e.g., emotional, physical) in the face of both internal and external stimuli. The attuned caregiver is aware of the infant's signals, anticipates the infant's needs, and responds contingently. Successfully navigating this developmental task, which the infant and nurturer must do together as one system, lays the positive foundation for the development of attachment.

Development of attachment and infant mental health

Winnicott (1987) said that it is impossible to describe the infant by itself, in this way: "I like to assume that if we see a baby we also see environmental provision, and behind this we see the mother" (p. 35). He also wrote that the earliest stages of mother-infant intercommunication lay the foundation for the infant's future mental health. Researchers in the area of attachment have built upon this idea and view the infant and mother as a unique interactional system. Thus, infant behavior can only be understood in terms of how it manifests within the relationship (Als, 1978; Emde, 1988; National Scientific Council on the Developing Child, 2004b). The relatively new field of infant mental health has greatly expanded our understanding of the importance of the relationship of the infant with his or her most trusted caregivers. The field is an interdisciplinary one that encompasses psychiatry, psychology, social work, early intervention, nursing, and the like. Infant mental health is usually described as the optimal development of the infant across all domains within the context of the family—however "family" is defined. The focus is on the relationship and the infant's social and emotional development, for it is this domain that is the cornerstone of all development. Without consistent, contingent, and nurturing relationships, the infant's development may be compromised. Infant mental health begins in the first interactions and is dependent upon positive and secure attachments. Indeed, as Foley (2006) so aptly put it, "[t]he engaged relationship…stands out as *the* potent medium through which the inside and outside are mediated." (p. 151)

Infants come into the world prewired for social interconnectedness; the infant's inherent nature is dyadic. The infant is prepared not only to engage in social exchanges, but also to understand them (Ainsworth, Bell, & Stayton, 1974; Brazelton, Kowalski, & Main, 1974; Emde, 1988; Markova & Legerstee, 2008). Trevarthen (1979) termed this capacity *intersubjectivity.* In addition, infants are capable of affective monitoring (Emde, 1983; Markova & Legerstee, 2008). They can interpret an experience according to whether it is pleasurable or not and, with their actions, guide the nurturer's response. If the nurturer's response successfully meets the baby's needs, it forms the basis of trust. Confidence in the primary caregiver is the foundation for subsequent self-confidence and competence (Ainsworth & Bell, 1974). It is critical that the infant experience the caregiver as trustworthy (Sroufe, 1979), for it is this earliest relationship that becomes later internalized into what Bowlby (1989) termed the *internal working model.* The infant comes to trust that he or she is both safe and worthy.

Based on the process of affective monitoring, infants adapt their behavior according to their perception of the primary caregiver's behavior (Markova & Legerstee, 2008; Tronick, 1989). Murray and Trevarthen (1985) provided a clear illustration of this inter-relationship in their studies of the interaction between two-month-old infants and their mothers. In three separate experimental conditions the patterns of reactions of the infants showed that they had a complex ability to organize their behavior in response to their mother's behavior. The infants not only interpreted their mother's behavior, they also attempted to alter it.

Infants use social exchanges as they strive toward homeostasis—to maintain balance in the face of internal and external stimuli and to use their states of consciousness to regulate the quality and quantity of the stimuli (Brazelton, 1984; Emde, 1983; Greenspan, 1981). This physiological regulation is accomplished by way of reciprocal social exchanges with the nurturer (Stern, 1985). For example, if the infant appears out of balance, either in terms of state or autonomic reactivity, and the nurturer is in tune with the infant's emotional signals, then the nurturer either steps back or moves in, as needed, to help the infant recover. These state and autonomic indices of overload are important for their communicative value. They send a message to the receiver and have, as such, "important functional consequences for transactions with the environment" (Campos, 1994, p. 7). If the infant can organize his or her behavior to orient and be alert to what is going on in the external environment, then the infant is rewarded by social stimulation from the primary other (Brazelton & Als, 1979). This sets up a feedback system for both the primary other and baby and provides a wonderful environment for mutual regulation. An alert, responsive infant is enormously rewarding to a parent, just as a responsive parent is rewarding to the infant.

If, however, maintenance of an alert state results in autonomic instability for the infant, the infant will become tired or irritable and will experience fewer alert periods because of the toll they take. This could lead to frustration on the mother's part and emotional distancing from the infant. This, in turn, could lead to a feedback loop in which the mother's emotional detachment further compromises the infant's attention and regulations systems (Crawford & Benoit, 2009). Because the infant is physically unable to move away from the caregiver, the infant in this situation "is faced with a paradoxical situation of fright without solution" (Crawford & Benoit, 2009, p. 127). Winnicott (1987) described the infant's feeling in this case as *unthinkable anxiety.* The transactional nature of the relationship can be thought of within the goodness of fit framework (Thomas, Chess, & Birch, 1968). For example, consider the infant who initially is rather disorganized, such that it is difficult for him or her to maintain physiological balance. A mother who is highly attuned to her infant's needs is able to facilitate the infant's ability to deal with the internal environment, as well as with the outer social environment. On the other hand, an infant who is initially organized but who has an unresponsive caregiver may fail to learn reciprocity as his or her needs remain

unmet (Brazelton, Kowalski, & Main, 1974). These patterns of behavior within the relationship tend to be repeated and carried forward, leading to an internal representation of regulation on the part of the infant (Bowlby, 1989; Perry, Pollard, Blakley, Baker, & Vigilante, 1995). Usually, mothers and babies do all right, learning from each other and correcting the missteps that are bound to occur in any relationship. But, what if interactive errors are repeated without reparation, leading the infant to experience the mother and, thus, the world as unreliable? The following two cases serve to illustrate the primacy of the emotional context of psychosocial development.

JONATHAN AND DAVID

The human infant is an amazing organism; long before he or she is born there are forces that help to shape the person who *is to become*. As early as birth we can see the person who *already is*. Newborns exhibit individual preferences for sights, sounds, touch, and textures. Some infants tolerate noise well, while others do not. Some enjoy the sensations that the mother's or father's voice provide; others can only tolerate either face or voice. Some infants are easily overloaded by the slightest addition of stimulation and need much help from the nurturer to calm down, while others are able to make adjustments to accommodate those additions and can either remain in a calm state, or need little help to get to it. Infants have remarkable capabilities for showing their nurturers what their preferences are and to let the nurturers know what they need from them. What is evident is that this relationship between the infant and his or her primary nurturers is a transactional one; the behavior of one changes the behavior of the other. In the neonatal period both partners in the dyad are beginning to learn from each other: the infant is learning to get his or her needs met by communicating those needs to the nurturer, while the nurturer is learning to interpret the infant's communication and responding contingently to it. It is a delicate dance in which toes get stepped on. But, if all goes well, both partners work to get the dance back in step. Sometimes reparations are not made, perhaps because the infant's signals are not clear to the nurturer, or perhaps because the nurturer misinterprets them. And, sometimes, the dyad cannot figure out how to make things right. The stories of Jonathan and David may help us understand the behavior of two infants who went home to two quite different environments, two different systems, and perhaps two different outcomes.

Jonathan and David were two unrelated infants who took part in a study of the effect of *in-utero* exposure to a labor-inhibiting drug on neonatal behavior (Thayer & Hupp, 1997). All infants in the study were assessed with the Neonatal Behavioral Assessment Scale (NBAS; Brazelton, 1984) three times in the neonatal period by the first author, who was trained and certified in the administration and scoring of the instrument. The NBAS was conceptualized as a measure of the infant's coping and adaptation in the neonatal period (Tables 1-3; Brazelton, 1984). When it is administered several times during this period, a curve of recovery can be obtained. An infant's curve indicates the strategies he or she is using to cope with and adapt to the environmental demands that are encountered. One expects to see change reflected as an upward trend of the curve. A curve that reflects no change or one that reflects a downward trend is cause for worry.

The first assessment of the infants in this study took place in hospital soon after delivery, the second at approximately two

Table 1. NBAS clusters.

Cluster	Definition
Orientation	Ability to alert and orient to animate and inanimate auditory and visual stimuli
Motor	Motor ability and tone
Range of state	Degree of infant's arousal during the assessment
Regulation of state	Response to arousal
Autonomic stability	Signs of stress as the infant strives to maintain homeostasis

Table 2. NBAS qualifiers.

Qualifier	Target cluster	Definition
Quality of alert responsiveness	Orientation	How much energy the infant invests in responses
General irritability	Range of state	How irritable in general the infant was to various types of stimuli presented during the assessment
State regulation	Regulation of state	How well the infant organized states and maintained alert state for longer periods of time
Cost of attention	Autonomic stability	How stressful the assessment was for the infant
Examiner persistence	--	How much effort it took on the part of the examiner to bring out the infant's best performance
Reinforcement Value of Infant's Behavior	--	Examiner's judgment of how rewarding it was for the examiner to work with the infant

Note: Except for the cluster "range of state", a higher score on the clusters and qualifiers indicates better performance.

Table 3. Explanation of states.

State	Definition
1	Deep sleep; respiration is regular; no eye movements
2	Light sleep; eyes are closed, but there may be rapid eye movements; respiration is irregular
3	Awake but drowsy; eyes may be partly open, or closed and fluttering. Baby may have a "far-away" look
4	Awake and alert; bright look; can invest attention to stimuli; minimum motor movement
5	Awake; exhibits much motor activity; fussy
6	Awake and crying; high motor activity

weeks post delivery, and the third at four weeks following delivery. The second and third administrations of the NBAS took place in the infants' homes. In addition, the mothers of the infants were asked to complete three questionnaires during the final administration of the NBAS. Two of the questionnaires had to do with the mothers' perceptions of their infants, and the third was concerned with the mothers' maternal self-esteem. Both the infant and maternal findings for Jonathan and David were quite different. In addition, the comparison between the two infants was striking because they were born on the same day and in the same hospital. As such, they were observed on the same day at all three time points.

Jonathan's story

Jonathan's mother was in her early thirties and married when Jonathan, her first child, was born. She held a B.A. degree, but was not employed at the time of Jonathan's birth. She had not experienced preterm labor, and thus did not receive any labor-inhibiting drugs. She had no other obstetrical complications. She received an epidural and was given pitocin to speed the labor process.

Jonathan was born at approximately 40 weeks' gestation weighing 7 lbs. 12 oz., with APGAR scores of 9 and 10. The first administration of the NBAS took place in the afternoon approximately 16 hours following his birth. He had been circumcised that morning, but he did not appear either unduly agitated or shut down. Despite the rigors of birth, circumcision, and interacting with an unfamiliar examiner, Jonathan performed well on all clusters of the NBAS. Although I[1] noted that his predominant state was drowsy (state 3), he was alert for the orientation items, and had only two indicators of autonomic instability (i.e., changes in color and respiration). The graphs of the NBAS clusters at time 1 (Fig. 1) illustrate Jonathan's performance at 16 hours post delivery. It is apparent that his best performance was on the orientation and autonomic stability clusters. This is of interest, because it indicates that Jonathan was able to maintain an alert state (state 4) for brief periods without major autonomic upset. I did have to work fairly hard to keep Jonathan engaged, as illustrated by the qualifier "examiner persistence" (Fig. 2), but this could be accounted for by his drowsiness, and the fact that he had periods of fussing (state 5). In my notes for time 1, I noted that he had "lots of fussing with rooting", and I wondered if he was hungry.

The second administration of the NBAS occurred in the living room of Jonathan's home, where a crib had been set up for him. Everything about this infant, as evidenced by his performance on the NBAS, suggested that he was an alert and engaging baby. His performance on virtually every item on the scale showed marked improvement over that of time 1. He was also rewarding to work with throughout the entire exam. He had one period of fussing during the exam, but he was able to self-quiet by putting his hand to his mouth. So, at this administration, I did not have to do much to keep Jonathan in an alert state; he managed to do this himself. His scores on the orientation items were higher for the animate items than for the inanimate items (9s vs. 8s). His one and only cry (state 6) came at the end of the exam; this is not surprising, given the amount of effort that it takes an infant this young to maintain an alert state and meet the demands of the various stimuli in the exam. The graphs of the clusters and qualifiers at time 2 (Figs. 1 and 2) indicate the upward trend in Jonathan's curve of recovery. It is interesting to note that his score on the qualifier "reinforcement value of infant's behavior" (Fig. 2) is 9, the highest score that can be obtained on the qualifiers. This is due, in part, by two striking things that I noted at this time. One was that Jonathan smiled two or three times, and the other was that he imitated me when I stuck out my tongue and when I made an "O" with my mouth. This infant was clearly alert and oriented to the social world and engaging.

The third administration of the assessment took place when Jonathan was 29 days old. When I arrived, Jonathan was awake and lying supine on the couch in the living room. What happened at this time was remarkable, for it seemed to demonstrate the capability of a one-month-old to express desire and intent through gesture and facial expression. When I sat down next to him his eyes brightened and he moved his head and body as if to say "hello". I was familiar with the studies of two-month-olds by Murray and Trevarthen (1985),

1. The reports of testing are presented in the first person by the examiner, who is the first author of this manuscript.

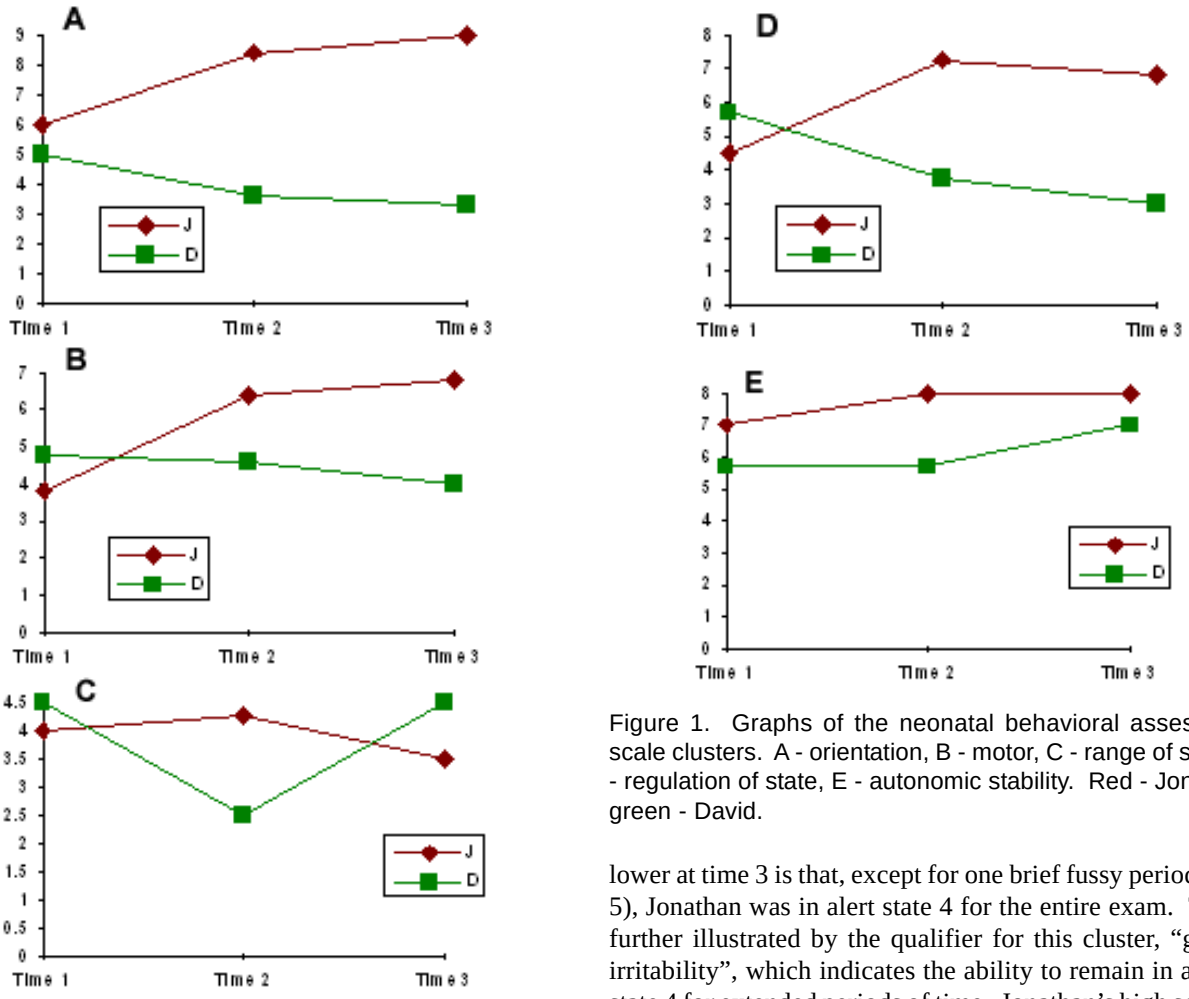

Figure 1. Graphs of the neonatal behavioral assessment scale clusters. A - orientation, B - motor, C - range of state, D - regulation of state, E - autonomic stability. Red - Jonathan, green - David.

and I wondered what Jonathan would do if I did not respond immediately to his bids for interaction. As I sat and just looked at him he began to move his whole body, including his mouth, and then stopped and looked at me as though waiting for me to do something. When I did not respond he resumed his movements and facial expressions, this time more vigorously. I waited a few more seconds without responding to see what Jonathan would do. His facial expression seemed to indicate puzzlement and, I thought, disappointment. He looked at me and then looked away a few times, and he appeared to be giving up on his bids for interaction. I could not allow him to become upset by continuing the "experiment" and, as I picked him up to begin the orientation items with him, he brightened immediately! These interludes demonstrated to me how capable this infant was not only responding to the social environment, but of eliciting responses from it *to change another's behavior.*

The graphs of the clusters and qualifiers (Figs. 1 and 2) illustrate Jonathan's steady recovery and remarkable capabilities at time 3. The reason that the score on the "range of state" cluster is lower at time 3 is that, except for one brief fussy period (state 5), Jonathan was in alert state 4 for the entire exam. This is further illustrated by the qualifier for this cluster, "general irritability", which indicates the ability to remain in an alert state 4 for extended periods of time. Jonathan's high score on this qualifier indicates that he was able to maintain self-control throughout the exam. He was obviously delighted with the social world, able to maintain alertness for extended periods of time without cost to his autonomic or motor systems. The qualifier "reinforcement value of infant's behavior" indicates just how delightful it was to interact with Jonathan. I wrote in my notes that he was a charming baby, one who just drew another to him, eagerly demonstrating his desire to engage in a reciprocal exchange with an *other*. When I left Jonathan's home I remarked to his mother about his social nature, and she said, "Oh, yes, we think he's a pretty neat baby! He's a lot of fun and we enjoy playing with him!"

David's story

David was born on the same day as Jonathan, seven hours earlier. He was the second child born to an unmarried, unemployed mother in her early twenties who had a high school education. David's mother experienced preterm labor at approximately 31 weeks' gestation and was given a labor-inhibiting drug to halt contractions. The drug was discontinued four days prior to David's birth at 38 weeks' gestation. His

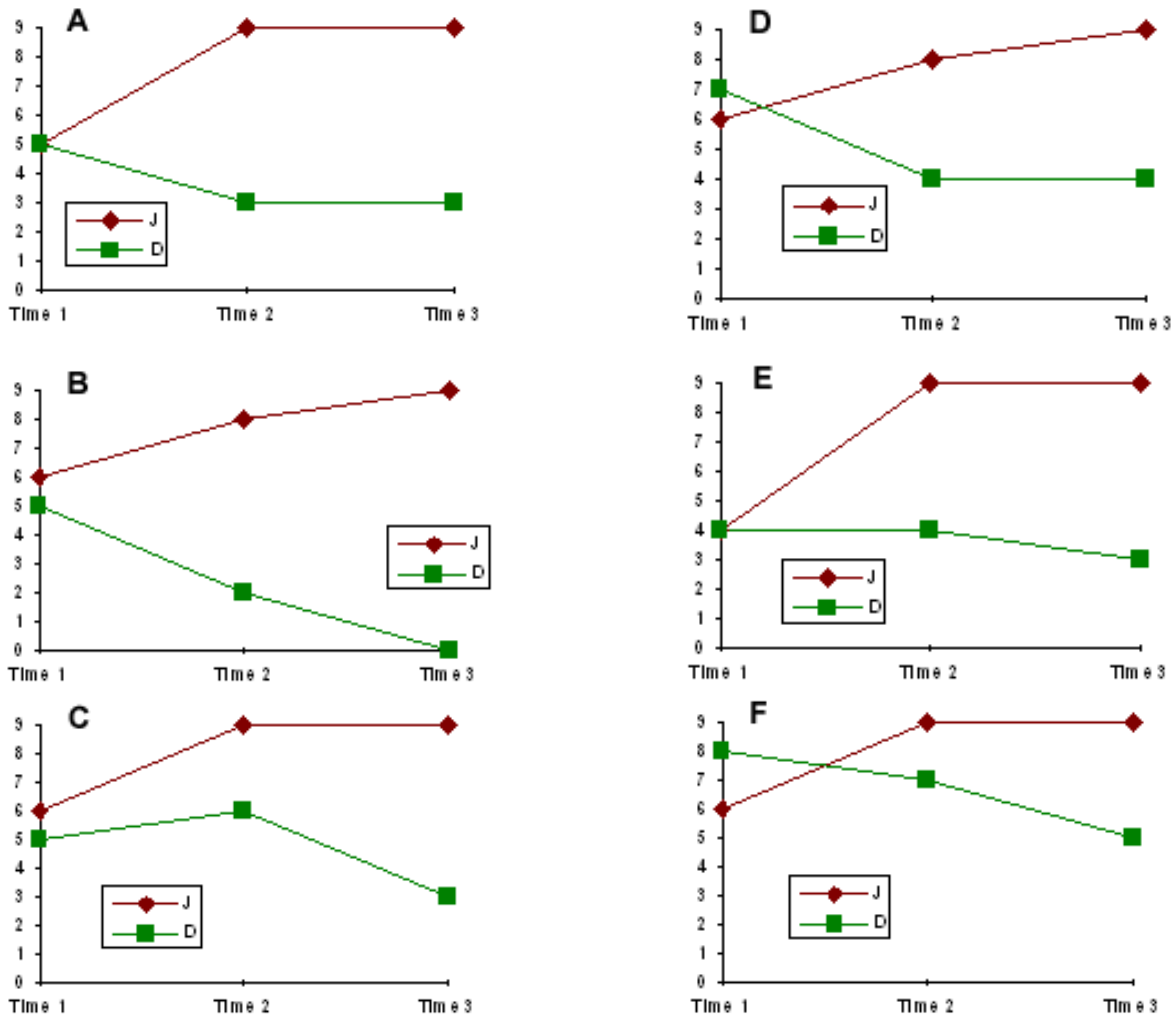

Figure 2. Graphs of the neonatal behavioral assessment scale qualifiers. A - quality of alertness, B - general irritability, C - state regulation, D - cost of attention, E - examiner persistence, F - reinforcement value of infant's behavior. Red - Jonathan, green - David.

mother was administered pitocin, as well as two pain-relieving medications during labor. David weighed 6 lbs. 3 oz. at birth, with APGAR scores of 8 and 9.

The first administration of the NBAS took place in the afternoon approximately 24 hours following David's birth. Like Jonathan he had been circumcised that morning. His predominant state was drowsy (state 3), as with Jonathan. David came to alert state 4 only briefly and responded to the animate orientation items better than to the inanimate ones. David never got upset during the exam; I noted that he was "too sleepy to cry". But, the exam appeared to cost him more than it did Jonathan. I observed several startles and tremors, as well as changes in color and respiration. The difference can be noted on the cluster "autonomic stability" at time 1 (Fig. 1). Jonathan's score was 7 on this cluster, compared to David's score of 5.7. One can also see from the graphs that, although Jonathan performed slightly better on the orientation items, the score on the qualifier for this cluster "quality of alert responsiveness" is the same for both infants. With each, it was somewhat difficult to bring out responsive behaviors. The score on the qualifier "examiner persistence" is also the same, which indicates that it took persistent efforts on my part to help both infants through the exam. The difference in the score on the qualifier "reinforcement value of infant's behavior" is accounted for by the fact that Jonathan had more periods of fussiness than did David. David was, on average, less available than was Jonathan. Even though both were predominantly in a drowsy state, Jonathan's alert periods were more frequent and lasted longer, even though I had to work to help him get there. At the end of this first administration with David I wrote in my notes: "I had to work really hard to get baby to state 4 and stay there for 5+ seconds. He was circumcised today, which may account for his shutting out behavior."

While the scores of the two infants were quite close together at time 1, there were marked differences at time 2. I learned that David had been hospitalized for three days with an upper respiratory infection and had been home for eight days when I saw him at time 2. Thus, some factors in this baby's early postnatal life were not optimal. He was asleep on the couch in the living room of his home when I arrived to administer the NBAS the second time. He appeared to be in a deep sleep (state 1), but after the administration of the first light and auditory stimuli, he became irritable (state 5) rather quickly. Throughout the exam, there were 15 state changes, alternating between drowsy (state 3) and either fussing (state 5) or crying (state 6). It is important to note here that the NBAS is an interactive exam that requires the examiner to help bring about the baby's *best* performance. Thus, the examiner must make every effort to try to ensure that he or she is eliciting the responses that the baby is capable of making. The score on the qualifier "examiner persistence" at time 2 (Fig. 2) indicates that it took persistent efforts throughout the exam to help David through it. David came to state 4 once, briefly, but he was irritable to many of the stimuli, had many state changes, cried several times beginning early in the exam, and was difficult to console. This is reflected in both the cluster "range of state" and the qualifier "general irritability". All of David's scores on the clusters and qualifiers, except for the "autonomic stability" cluster, were lower at this time than they were at time 1. One can see this in the downward trend of his recovery curve at time 2. Following the exam I wrote: "It was very difficult to arouse him from state 3: most attempts to do so resulted in state 6 crying. Holding, rocking, and pacifier helped to calm him, but he remained unavailable for the last half of the exam."

The third administration, at 29 days, again took place in the living room of David's home. He was lying on the couch in a light sleep when I arrived. This administration was even more difficult than the second, once again due to David's unavailability for interaction. He was never out of state 3 and, although he was not irritable this time, he simply could not be aroused to an alert state. On the orientation cluster he made no response to the animate or inanimate visual items, and only briefly responded with little interest to the other items on this cluster. This is the social part of the exam, and I could not get David to respond, despite persistent efforts to wake him. His score on the orientation cluster was slightly lower at time 3 than at time 2. David's score on the "range of state" cluster is higher than Jonathan's at this time point, but this is somewhat misleading, due to the fact that the scores on the individual items are recoded. In addition, the qualifier for this cluster, "general irritability," illustrates the marked difference in performance. Jonathan's high score indicates that he was not irritable to any of the stimuli, whereas David's behavior did not fit any of the scoring criteria and he could not be scored on this qualifier. In a similar vein, while the scores on the cluster "autonomic stability" are fairly even at time 3, the scores on the qualifier for the cluster "cost of attention" are markedly different.

Jonathan's score (9/9) indicates that he was responsive and stable throughout the exam, while David's score (4/9) indicates that he used unavailable states to maintain himself. This pattern was also evident for both infants at time 2. And, one can see that at time 3 the interaction with David was not rewarding for the examiner, a fact that saddened the examiner. What is most striking is the trend of the recovery curve for each baby: Jonathan's is ascending, whereas David's is descending. The descending curve is contrary to what one expects to see, and this pattern was not seen with any other infant (N=48) in the study (Thayer & Hupp, 1997). Following this administration I wrote: "It was difficult to score this exam as baby only got to state 3, and although he was responsive to sound (voice, rattle) in that state, I could not do the visual or auditory/visual items since he did not open his eyes. I jiggled, bounced, spun, sat him up, and burped him, but nothing I did brought him to state 4. He remained in unavailable states 2 and 3. It would be nice to see this baby when he is awake and alert."

Two things happened at the end of David's exam that struck me as noteworthy. One was the fact that David's mother described him as "bad" and "not much fun." Considering the transactional nature of mother-infant relations, it appears that neither may have been highly reinforced by the other. The other thing occurred as I was preparing to leave. I told David's mother that his muscle tone was quite good and that he had a strong primitive crawl. I said that meant that he could scoot off a surface quickly if one wasn't paying attention. She gave no response and started up the stairs. David was still lying prone on the couch, and I asked her if I should move him to a safer place. She replied, "Oh, just leave him there." This striking statement indicates a lack of synchrony in their relationship. It may also indicate that this mother's representation of her infant is disengaged and that she is unable to see things from David's point of view (Sokolowski, Hans, Bernstein, & Cox, 2007; Demers, Bernier, Tarabulsky, & Provoste, 2010).

Mother Measures

The Neonatal Perception Inventory (Broussard & Hartner, 1971) measures the mother's perception of her baby's patterns of crying, feeding, spitting up, sleeping, bowel movements, and predictable patterns of eating and sleeping. The mother also rates what she thinks the "average baby" is like on each of the six items. Lower scores on the items represent more desirable behavior. A discrepancy score is derived by subtracting the "your baby" score from the "average baby" score. Both Jonathan's and David's mothers perceived their babies as "better than the average baby", but Jonathan's mother's discrepancy score was higher (i.e., more positive) at

4, vs. 2 for David's mother. Even though David's mother's discrepancy score is less positive than Jonathan's mother's, she did perceive him as better than the average baby. This was somewhat surprising, given her negative remarks at the end of time 3, but it may positively have reflected that some degree of self-efficacy in the parenting role remained, which would be a valuable building point for future relationships with her son.

On the Maternal Self Report Inventory (Shea & Tronick, 1988), a measure of maternal self-esteem, Jonathan's mother's scores were higher on all of the clusters except "parental acceptance", which refers to the mother's own parents' acceptance of her. However, it is interesting to note that she qualified her responses on this cluster with written comments that indicated that she planned to be a better parent than her parents were. She wrote: "I'll be more nurturing"; "My mother was not very nurturing, so I plan to be very nurturing"; My father took off"; "I know I can give my baby tons of love." Her summary score on the measure (450/495) was significantly higher than David's mother's (375/495), indicating a higher perception of herself as a mother.

Analysis

The questions raised by the stories of these two infants can tell us much about supporting the caregiving environment. What does a baby tell us by his unavailability for interaction? Is the hidden message in a mother's negative appraisal of her baby one of asking for help with this baby who seems so unresponsive? In a similar vein, dare we ignore the unasked question of a mother who strives to be a better parent than her own parents were for her? Can we hear in her responses the need for reassurance that she is doing all right?

The caregiving environments of Jonathan and David were substantially different in both emotional tone and resources of the caregivers. But, it is not enough to know that David's mother lacked the education, support, and financial resources that Jonathan's mother had. Poverty and lack of education are factors in child rearing, but they are not the only ones. Baumeister, Kupstas, and Klindworth (1992) proposed a conceptual model of the "new morbidity", which described development as influenced by biological and psychosocial factors that cannot be separated out into simple cause and effect. According to this model, the transactions in the caregiving environment depend on the synergistic interaction of prenatal factors, postnatal biological status, and social influences, such as financial, personal, and social resources, and demographic and behavioral variables. Thus, using this model as a framework, Jonathan's and David's stories may be viewed as representative. In each case these synergistic factors were at work, and one might well speculate on how they might have contributed to the observable behaviors of both the mothers and the babies.

Could David's mother have been overwhelmed by the threat of preterm delivery and the necessity of medical intervention to prevent it, compounded by David's early illness and hospitalization and her own limited resources? Abrams, Field, Scafidi, and Prodromidis (1995) found that infants of depressed mothers exhibited poor performance on the NBAS orientation cluster, especially on the inanimate orientation items. The infants also exhibited unavailability and lethargy during the assessment. Abrams et al. (1995) theorized that the poor performance on the inanimate orientation items could indicate a higher sensory threshold on the part of these infants, and that they might require more robust animate stimulation to increase their responding. One must wonder if David remained unavailable due to a high threshold of arousal which was not counteracted by more animate stimulation from his mother, and if this had already set up a pattern of interaction that may have been difficult for this dyad to overcome. If a baby's signals indicate that he or she needs more energy on the part of the nurturer and those signals are misinterpreted or ignored, the baby may remain in an unavailable state in order to avoid experiencing *unthinkable anxiety* (Winnicott, 1987). Even in those instances in which the social environment is positive, the baby may remain disengaged because the pattern of withdrawal is becoming internalized (Perry et al., 1995). If all learning begins in interpersonal relatedness (Winnicott, 1988), we must take great care to help such a dyad overcome the obstacles that prevent the reparation of the interactive errors. The needs of each member of the dyad are great, and we cannot focus on the needs of one without also paying attention to those often unspoken needs of the other. Even when things seem to be going well, as in the case of Jonathan and his nurturers, there are factors not always apparent unless one is attuned to the unspoken messages of the caregiver.

What if David had gone home with Jonathan's animated and empathetic mother? Would he have been a responsive, rewarding baby, despite his tenuous start in life, eliciting the positive statements that Jonathan did? Or would his struggles with social interaction have affected Jonathan's mother in a way similar to David's mother? What if Jonathan had gone home to David's caregiving environment? Would he have been the delightful, social baby that he was? Might he have given up trying to elicit responses from a mother who would perhaps have been psychologically unavailable to him? One can only speculate on the answers, but the questions speak to the important role of home visitors with training in infant mental health.

Many programs across the country that utilize home visitors are beginning to incorporate infant mental health practice, especially in those states that have an infant mental health endorsement system (see, for example, kaimh.org). Zero to Three has worked closely with Early Head Start to train and support efforts in infant mental health. But, as Shonkoff and

Phillips (2000) pointed out, "[g]iven the substantial short- and long-term risks that accompany early mental health impairments, the incapacity of many early childhood programs to address these concerns and the severe shortage of early childhood professionals with mental health expertise are urgent problems" (p. 5).

Selma Fraiberg (1987) said: "When [the] mother's own cries are heard, she will hear her child's cries" (p. 109). In our work we must hear the mother's cries, in whatever form they take, to help us answer the question "what about the baby?" Every new parent needs reassurance that he or she is doing all right as nurturer, or the support to ensure that things do go all right if they don't start out that way. Whatever our role with infants and families, we must focus our attention and our efforts on the transactions that are supportive, or not, between the infant and the caregiving environment, for one does not exist without the other.

References

Abrams, S., Field, T., Scafidi, F., & Prodromidis, M. (1995). Newborns of depressed mothers. *Infant Mental Health Journal,16*(3), 233-239.

Ainsworth, M., & Bell, S. (1974). Mother-infant interaction and the development of competence. In K. Connolly & J. Bruner (Eds.), *The growth of competence* (pp. 97-118). New York: Academic Press.

Ainsworth, M., Bell, S., & Stayton, D. (1974). Infant-mother attachment and social development: 'Socialisation' as a product of reciprocal responses to signals. In M. Richards (Ed.), *The integration of the child into a social world (pp. 99-135). Cambridge: Cambridge University Press.*

Als, H. (1978). Assessing an assessment: Conceptual considerations, methodological issues and a perspective on the future of the Neonatal Behavioral Assessment Scale. *Monographs of the Society for Research in Child Development,43* (5-6, Serial No. 177).

Baumeister, A., Kupstas, F., & Klindworth, L. (1992). The new morbidity: A national plan of action. In T. Thompson & S. Hupp (Eds.) *Saving children at risk: Poverty and disabilities* (pp. 143-177). Newbury Park, CA: Sage Publications.

Benedek, T. (1949). The psychosomatic implications of the primary unit: Mother-child. *American Journal of Orthopsychiatry, 19,* 642-654.

Bibring, G., Dwyer, T., Huntington, D., & Valenstein, A. (1961). A study of the psychological processes in pregnancy and of the earliest mother-child relationship. *Psychoanalytic Study of the Child, XVI,* 9-72.

Bowlby, J. (1989). The role of attachment in personality development and psychopathology. In S. Greenspan & G. Pollock (Eds.), *The course of life: Volume I: Infancy* (pp.229-270). Madison, CT: International Universities Press.

Brazelton, T. B. (1984). *Neonatal behavioral assessment scale* (2nd ed.). Philadelphia: J. B. Lippincott.

Brazelton, T. B., & Als, H. (1979). Four early stages in the development of mother-infant interaction. *Psychoanalytic Study of the Child, 34,* 349-369.

Brazelton, T. B., & Cramer, B. (1990). *The earliest relationship: Parents, infants, and the drama of early attachment.* Reading, MA: Addison-Wesley.

Brazelton, T. B., Kowalski, B., & Main, M. (1974). The origins of reciprocity: The early mother-infant interaction. In M. Lewis & L. Rosenblum (Eds.), *The effect of the infant on its caregiver* (pp. 49-76). New York: John Wiley & Sons.

Broussard, E., & Hartner, M. (1971). Further considerations regarding maternal perception of the newborn. In J. Helmuth (Ed.), *The exceptional infant: Studies in abnormalities* (pp. 432-449). New York: Bruner/Mazel.

Campos, J. (1994, Spring). The new functionalism in emotion. *Society for Research in Child Development Newsletter,* 1, 7, 9-11, 14.

Crawford, A., & Benoit, D. (2009). Caregivers' disrupted representations of the unborn child predict later infant-caregiver disorganized attachment. *Infant Mental Health Journal, 30*(2), 124-144.

Demers, I., Bernier, A., Tarabulsy, G., & Provost, M. (2010). Maternal and child characteristics as antecedents of maternal mind-mindeness. *Infant Mental Health Journal, 31*(1), 94-112.

Emde, R. (1983). The prerepresentational self and its affective core. *Psychoanalytic Study of the Child, 38,* 165-192.

Emde, R. (1988). Development terminable and interminable: Innate motivational factors from infancy. *International Journal of Psycho-Analysis, 69,* 23-42.

Foley, G. (2006). Self and social-emotional development in infancy: A descriptive synthesis. In G. Foley & J. Hochman (Eds.), *Mental health in early intervention: Achieving unity in principles and practice* (pp. 139-173). Baltimore MD: Paul H. Brookes Publishing Co., Inc.

Fraiberg, S. (1987). Ghosts in the nursery: A psychoanalytic approach to the problems of impaired infant-mother relationships. In L. Fraiberg (Ed.), *Selected writings of Selma Fraiberg* (pp. 100-136). Columbus, OH: The Ohio State University Press.

Greenspan, S. (1981). Homeostasis. In S. Greenspan (Ed.), *Psychopathology and adaptation in infancy and early childhood* (pp. 17-48). New York: International Universities Press.

Lipton, M. (1976). Early experience and plasticity in the central nervous system. In T. Tjossem (Ed.), *Intervention strategies for high risk infants and young children* (pp. 63-73.) Baltimore: University Park Press.

Markova, G., & Legerstee, N. (2008). How infants come to learn about the minds of others. *Zero to Three, 28*(5), 26-31.

Murray, L., & Trevarthen, C. (1985). Emotional regulation of interactions between two-month-olds and their mothers. In T. Field & N. Fox (Eds.), *Social perception in infants* (pp. 177-197). Norwood, NJ: Ablex.

National Scientific Council on the Developing Child. (2004a). Young children develop in an environment of relationships: *Working Paper No. 1*. Retrieved from http://www.developingchild.harvard.edu

National Scientific Council on the Developing Child. (2004b). Children's emotional development is built into the architecture of their brains: *Working Paper No.2*. Retrieved from http://www.developingchild.harvard.edu

Perry, B., Pollard, R., Blakley, T., Baker, W., & Vigilante, D. (1995). Childhood trauma, the neurobiology of adaptation, and "use-dependent" development of the brain: How "states" become "traits". *Infant Mental Health Journal, 16* (4), 271-291.

Shea, E., & Tronick, E. (1988). The Maternal Self-Report Inventory: A research and clinical instrument for assessing maternal self-esteem. In H. Fitzgerald, B. Lester, & M. Yogman (Eds.), *Theory and research in behavioral pediatrics: Volume 4* (pp. 101-139). New York: Plenum Press.

Shonkoff, J., & Phillips, D. (Eds.). (2000). *From neurons to neighborhoods: The science of early childhood development.* Washington, D.C.: National Academies Press.

Siegel, D. (1999). *The developing mind: Toward a neurobiology of interpersonal_experience.* New York: The Guilford Press.

Sokolowski, M., Hans, S., Bernstein, V., & Cox, S. (2007). Mothers' representations of their infants and parenting behavior: Associations with personal and social-contextual variables in a high risk sample. *Infant Mental Health Journal, 28*(3), 344-365.

Sroufe, L. A., (1979). The coherence of early development: Early care, attachment, and subsequent developmental issues. *American Psychologist, 34*, 834-841.

Stern, D. (1985). *The interpersonal world of the infant.* New York: Basic Books.

Thayer, J. S., & Hupp, S. (1997). In utero exposure to terbutaline: Effects on infant behavior and maternal self-esteem. *Journal of Obstetric, Gynecologic, and Neonatal Nursing, 26* (6), 691-700.

Thomas, A., Chess, S., & Birch, H. (1968). *Temperament and behavior disorders in children.* New York: New York University Press.

Trevarthen, C. (1979). Communication and cooperation in early infancy: A description of primary intersubjectivity. In M. Bullowa (Ed.), *Before speech: The beginning of interpersonal communication* (pp. 321-347). Cambridge: Cambridge University Press.

Tronick, E. (1989). Emotions and communication in infancy. *American Psychologist, 44*, 112-119.

Winnicott, D. (1987). *Babies and their mothers.* Reading, MA: Addison-Wesley.

Winnicott, D. (1988). *Human nature.* New York: Schocken Books.