

CHAPTER 4

A Brain-Based Understanding From the Cradle to the Grave

SONDRA GOLDSTEIN and SUSAN THAU

Since the beginning of human existence, long before there was any record, people have been forming bonds with their primary mates and living in social groups. There is an important reason for this: we need each other to exist, to be safe, and for companionship. The threats to the caveman and his family were primarily animal and environmental forces that lurked outside their dwelling. The threats of modern life are of a very different kind. Modern life, with its myriad complexities, requires much more consciousness just to survive. Our lives are rarely tranquil. Living in the 21st century means we are being bombarded by the forces of nature with an ever increasing intensity as the result of modern technology. To face the complexities of life, humans, from the past into modern times, have formed partnerships with family and friends. Our connections to intimate others, and how we relate to them, determine a great deal about the quality of our lives.

We know that just having another person by our side is not enough. It is how that relationship develops and endures that counts. Until recently the matter of how we engage in our most intimate relationships seemed pretty much a matter of chance or good luck. Now, with advances in our understanding of intimate relationships and the workings of the brain, partners can learn about the actual dynamics of their relationship and the transactional patterns of communications, both verbal and nonverbal, that occur. This look into each person's window of tolerance (Schoore,

2003) has much to do with how conflict is handled or avoided—how the emotional state of both partners creates a thriving relationship or one that is primarily dysfunctional. The concept of having a window of tolerance refers to the emotional range of flexibility that individuals exhibit in their interpersonal relationships.

This change in our ability to understand the workings of relationship has come about because of the developments in the emerging field of neuropsychobiology. To understand what this is about, it is necessary to go back to the beginning of human development to when babies are conceived. We now know that experiences in the uterine world are far from passive (Raphael-Leff, 1991). The parents' DNA is joined at the moment of conception; shortly afterward developing fetuses are affected by their mother's body, and they pick up on the transmissions from the world around them. The mother's moods and arousal level are transferred directly into fetuses' developing nervous system—allowing ambient trauma to affect neonates. Once babies are born there is even more direct opportunity for transmission of parental anxiety to occur.

While infants come into the world with a specific wiring pattern, the nervous system is shaped and formed in the ordinary and repetitive interactions between the mother and her infant. The awesome result of the interaction of these powerful forces determines the beginning capacity to form the attachments that are so significant from cradle to grave (Bowlby, 1982). Warm, appropriate responsiveness by parents is essential for infants' capacity to experience caring, to learn to regulate themselves, and to be able to venture out in the world. This means feeling safe enough in their own world to develop a growing interest in what lies beyond. But how does this all begin? What are the actual mechanisms that create this regulatory process? Again, what has been learned about relationships and the developing brain provides a way of conceptualizing this intense experience?

The focus of this chapter is interpersonal neurobiology, which examines the way our bodies and minds together create either harmony and consonance or discord and dissonance. Without question, those who are fortunate enough to have been born into health-promoting experiences will experience pathways in life with others that are easier and probably more satisfying. We consider why this is so and what can be done when these earliest experiences do not foster comfortable attachments. We suggest ways that security can be earned throughout the life cycle through experiences and relationships that both supplement and override the previously detrimentally destructive relationships. This perspective comes directly out of the perspective of neuropsychobiology—that our brain and body have an innate resiliency and capacity to repair.

Attachment and Affect Regulation

John Bowlby's name is immediately mentioned whenever attachment is discussed. Bowlby's lifetime work began when he became interested in imprinting in animals. As a follower of Oken Lorenz and Charles Darwin, he concluded that certain behaviors in animals and birds could develop only during a particular time period and under certain conditions (Karen, 1994). He saw unmistakably that if birds were not exposed to one of their own species during the crucial time period, certain aspects of development did not occur (Bowlby, 1958). From these interesting studies, he began to generalize to human infants as well. His conclusions came from working with orphaned infants and children during the traumas of World War II. From observing these children, he came to wonder what would happen if caretakers were either completely absent or were inconsistent in their availability. Would infants behave and relate differently if they had parents present and regularly responsive? What happened to children who had to endure permanent separations from their caregivers?

Au: First name for Lorenz OK here?

The emerging theory that Bowlby proposed was based on the assumption that the relationship between a mother and infant has a profound and lasting influence upon the developing child's capacity to function and persevere (Bowlby, 1958). Attachment theory is a theory of emotional regulation (Schore, 1994). Bowlby proposed that infants respond and need the physical proximity of a caring and attuned parent to develop a sense of security and safety. The combination of physical proximity and emotional attunement act as a buffer protecting the developing child from feeling alone and unwanted in the vast and uncertain world.

Mary Ainsworth and Mary Main, followers of Bowlby, created a series of experiments to determine how small children would respond to their primary caregiver departing suddenly and then reappearing. This famous experiment, known as the Stranger Situation (Ainsworth, Blehar, Waters, & Wall, 1978), focused on the emotional disruption caused by this act of the separation. These results continue to be replicated across cultures and in different experimental conditions, and the outcomes continue to verify the significance of the attachment bond as a stabilizing force in the emotional life of a growing child. This bond provides a way of understanding the role of emotions in our interpersonal relationships. From the moment of birth, the caregiver's emotional state is being transmitted on a moment-to-moment basis from right brain to right brain (Schore, 2003).

This transmission, which goes on dyadically, is the most basic way human infants learn about the world. It begins at birth long before conscious and intentional thought is possible. The human brain is uniquely constructed to make this incredible learning possible. The complexity of the human brain means that its midstructures, specifically the limbic system,

are in place at birth. This part of the brain acts as a receptor for the signals of transmission both internally and externally and is involved in learning, memory, motivation, and emotion (Cozolino, 2002). The amygdala, the part of the limbic system that is receiving these signals, comes online shortly after birth. The amygdala's job, as the internal red alert system, is to determine whether the conditions in the surroundings are safe, and thus the amygdala directly affects how this regulation system develops.

The transmissions affecting this alert system are ongoing with automatic and rapid processing occurring instantaneously. That is how our autonomic nervous system develops its responsiveness. When the response to infants is primarily consistent and caring, it is more likely that infants' nervous system will be in a nondistressed state. In effect, the caretaker is transmitting through her emotional right brain, which is picked up in the infant's right brain, so they continue to transfer their emotional states back and forth, creating a sense of mutuality. In other words, there is minimal autonomic arousal or triggering, and infants remain calm. In contrast, if the mother is in a more agitated, dysregulated state, her transmissions will contain unmetabolized affect. Young children cannot defend against the bombardment of any intense emotionality and in effect will be overwhelmed by the conditions from which they cannot escape. If this inescapable dysregulation occurs with some regularity, young children's ability to maintain their own homeostasis will be compromised. The overwhelming inescapable state of being trapped, which is the fate of highly dependent infants, is the pathway, the genesis, of the undoing of children's regulatory capacity.

Intense emotionality triggers the limbic system (specifically the amygdala) to be alert and to signal the sympathetic nervous system's response of flight or fight; either response creates arousal, and this arousal has the potential to permanently alter developing children's delicate nervous system. Fight and flight both affect the HPA axis, the neuroendocrine system responsible for excretion of the neurochemical cortisol. This substance is known for its adverse effects on our body and health, including its association with autoimmune disorders, diabetes, and chronic heart disease (Kiecolt-Glaser & Newton, 2001; Schmidt, Nachtigail, Wiethrich-Martone, & Strauss, 2002).

We humans are born with our own unique wiring pattern, which is the result of each individual's genetic background. Along the continuum of emotional regulation, some generalizations can be made. This capacity is what we commonly call our nature. It can be conceptualized in a number of ways including flexibility versus rigidity, calm versus distressed, or tense versus relaxed. This innate capacity to regulate is affected directly by the regulatory capacity of the primary caregivers. In addition, primary caregivers' capacity to maintain homeostatic balance is either enhanced by or interfered with by their own support system. Caregivers who have a

good enough relationship with others will more likely be able to feel secure in the complicated task of bonding with their child (Lieberman, Padron, Van Horn, & Harris, 2005).

Caregivers' ability to tolerate and inhibit their own arousal system creates the building blocks that will eventually be the foundation and scaffolding of the developing child. While some caregivers, through reflection and self-awareness, are aware of this awesome responsibility, others function in a highly self-focused state, which in effect acts as a barrier in terms of forming a real attachment to their children. The developing children respond and thrive when there is a real feeling of mattering to another, a sense of being held in their caregiver's mind (Siegel, 1999). This is the pathway that occurs on an ongoing basis between caregivers and their children.

The result of this regular interaction involving emotional transmission is the laying down of the tracks that form part of the foundation of children's regulatory capacity. This capacity is thought of as the ability to self-regulate, or to calm down when in a state of arousal. Physiologically it is often referred to as having good vagal tone (Schorre, 2003). To function adequately, it is also necessary to be able to seek comfort, to use the regulatory capacity of another, and to seek mutual regulation. One of the hallmarks of good affect regulation is that individuals have developed the ability to shift back and forth between both modes of emotional functioning—to use both self- and mutual regulation. Neuropsychobiologically, this means that even when experiencing arousal others are felt to be safe enough and consistent enough that their presence is desired and is both comforting and soothing. This is the definition of a secure attachment.

Again, our brain's multiplicity of functions gives us the capacity to be in the presence of others and to read and take in their emotional cues, the external indication of emotional states. Human communication is exceedingly complex because of the intricate system of facial muscles that enable the transmission of emotional states. This rapid sequence of changing facial expressions reveals quickly these internally experienced, body-based emotions. This capacity to read the emotional states of others begins shortly after birth involving rapid processing right brain to right brain between the infant and its caretaker. This processing goes on as a means of survival long before any of the higher cortical functions come on line. As we develop the capacity for language, we are able to name these emotional states that are both transitory and highly significant in terms of being able to feel safe enough to be with other people. The states euphemistically referred to as *feelings* are generally defined as states of being that are processed internally, automatically, and without any language or conscious thought. Feelings are implicit or interoceptive (Schorre, 2003) and are experienced as sensations emanating from the body in a transient way.

Affect Regulation and Internal Working Models

Until recently the matter of how we engage in our most intimate relationships was considered an innate or intuitive function. However, many people are emotionally ignorant both of their own cues as well as those of others. Conceptually these individuals tend to be primarily oriented to their left brain—to language and linear thinking. They have limited awareness of their body arousal and feeling states. In contrast, others may be primarily right-brain dominant with a great sensitivity to their own emotional processes as well as those of people around them. These individuals are more likely to have a strong sense of their internal experience and are highly attuned to the emotional states and cues of others. Part of the dyadic process of relating from a neuropsychobiological perspective has to do with how well this process of transmission goes between the partners, which includes all forms of dyads, caregiver and child, husband and wife, siblings or close friends.

In all these relationships, there is both the capacity for regulation based on attunement as well as failures because one or both individuals are unable to read these emotionally transmitted cues. This emotional blindness, or inability to read and be sensitive to the cues of others, may cause very difficult dyadic interactions. Nevertheless, this is where it all starts. These ordinary, regular, moment-to-moment transmissions, though not consciously learned, form the basis of how young children experience themselves in the world. This is called implicit relational learning, and it occurs without any conscious awareness, emerging as a result of the actual lived experience. The result of these ordinary, repetitive interactions can be gleaned from the perspective and expectations that individuals reveal as they live and interact with the others with whom they have a relationship. Bowlby (1982) referred to these inner interpretations of relationships and the world as our internal working models. These internalized schemas or templates in effect determine the expectations, hopes, and fears that form the foundation of what individuals will come to expect from others during the rest of their lifetime. In this way, this implicit knowledge, while not consciously held, determines whether other people or situations are experienced as safe or unsafe. It also relates to the important ability to experience hope and positive perspectives and a state of basic trust in others. This attitude is carried forward from early childhood, often without interpretation or cognitive processing, and is just part of persons' sensibility because of the nature and quality of these earliest attachment experiences.

The types of behaviors that bond children to a caretaker are not just creating expectations; they are also the basis of actual structural changes in the brain itself. This is because emotions are not just feelings; they correspond to actual structures and activity. Attachment experiences directly

affect the wiring of the brain (Goldstein & Thau, 2004). The pathway of transmission of the signals from the top down (i.e., limbic system to the gut, or the enteric nervous system) and from the top up (i.e., limbic system to the cerebral cortex) is rapid, continuous, and automatic. But it is how these pathways are layered that essentially determines that flexibility or rigidity of developing children's emotional and attachment schemas.

Secure and Insecure Attachment Models

To gain a perspective on the development of these cortical and subcortical structures in the early maturing brain, it is helpful to examine the differences in the way these early interactions occur. There is no such thing as perfect attunement, but when there is a good enough responsiveness, there is usually a balance in terms of quietness and arousal. These emotional signals are transmitted automatically from the right brain of the caregiver into the developing right brain of the infant where they have to be metabolized and integrated into the emergent nervous system, neuron to neuron. The consistency of the caregiver provides an expectation that is translated into children's response system in terms of flexibility, fluidity, and resiliency. Gradually, this will likely develop into what we call security in terms of having a sense of basic trust in oneself as well as in others.

We know that secure individuals are able to interact in a variety of situations and move through these with an ease that differentiates them from individuals who cannot do this. This means that difficult situations are managed by people's internal capacity to experience the emotion, manage their state, whatever it is, and still maintain their sense of self both cognitively and emotionally. This congruence forms the scaffolding that allows the cohesiveness of individuals to be maintained even when challenges to their nervous system are experienced as difficult to manage. Secure attachment bonds allow a safe exploration of the world, flexibility in dealing with change and stress, trust with intimate others, free expression of emotions, and a positive outlook with self and others. Secure attachment bonds between caregiver and child foster an ongoing sense of possibility and hope and a generally optimistic outlook.

The good enough bond between parent and child that fosters secure attachment relationships does not always occur in early development. If the key ingredients of affect regulation, reliable emotional and physical availability, and emotional attunement are not provided consistently by the primary caregiver, children are unable to develop effective affect regulation skills and ability to trust in a developmental progression. Rather than developing a secure attachment bond, children tend to develop an insecure attachment bond. The children's internal working models, predictors of interpersonal experiences, lead them to expect negative or

untrustworthy behavior from other people. The nature of the children's insecure attachment bond may vary depending on their experiences with the primary caregiver. If the caregiver is emotionally distant, unavailable, or rejecting, the children may develop an avoidant attachment style (George & Solomon, 1999). Fear of emotional closeness with an expectation of unavailability and rejection are the defining characteristics of the insecure avoidant attachment style. In answering the attachment question, "Can I count on other people to be there for me?" for insecure avoidant children the answer will be no.

Insecure ambivalent attachment styles emerge from infant-caregiver interactions characterized by unpredictable caregiver vacillation among rejecting, intrusive, and emotionally available behavior. Intrusive parents believe that their "helpless" children must be protected against experiences of failure and unfairness in life. Hovering over the children, they gain a sense of parental efficacy and security by controlling their every action. In this age of technology, intrusive parents may "check on" children by e-mail, cell phone, text messages, and global positioning systems (GPSs), which track children who drive. They may require that their children call them several times daily and report on their every move. These children feel under scrutiny by their parent. Insecure ambivalent children become highly anxious and vigilant to be prepared for unpredictable caregiver rejection, intrusion, and occasional emotional availability (Sable, 2000). These children tend to be fearful and uncertain about the trustworthiness of relationships and fear engulfment and control (rather than true closeness). Their answer to the attachment question, "Can I count on others to be there for me?" is maybe.

A third insecure attachment category is the insecure disorganized attachment style. This style emerges from caregiver-infant interaction characterized by affect dysregulation, emotional or physical abuse, and volatility with threatened and actual abandonment. The source of potential security, the caregiver, becomes instead the source of danger for the children. The dilemma facing the children is very real in that they are drawn to the caregiver for comfort yet feel that the caregiver may be dangerous and frightening. The children develop an insecure disorganized attachment style characterized by erratic and contradictory behavior. For instance, they may display hopeful-seeking behavior followed by avoidance, freezing, or dazed behavior. Crying for the caregiver after separation may be followed by rage upon reunion. Children with insecure disorganized attachment style are unable to use consistent strategies when alarmed. They cannot seek support and comfort from the caregiver (secure attachment), shift attention away from the caregiver (avoidant attachment), or oscillate between seeking and resisting comfort (anxious-ambivalent attachment). Insecure disorganized children's answer to the attachment question, "Can

I count on others to be there for me?” is a confused I don’t know and I don’t know what to do (Sable, 2000).

Insecure Attachment and Stress

Although different in manifestation and prediction about the dependability of others, the three insecure attachment styles have common characteristics. Poor stress management is found in all of these insecure attachment working models. Securely attached children have a history of an attuned caregiver who can correctly assess and respond to their positive and negative affect. If there is misattunement on the caregiver’s part, the caregiver guides an interactive repair, which allows the child to safely recover from the misattunement. The child–caregiver dyad transition smoothly between positive to negative and back to positive affect. The fluidity of affect change in secure attachment creates greater resilience in dealing with stress.

In the environment of the insecure caregiver–child dyad, there are frequent and enduring high levels of negative affect and low levels of positive affect. Because the caregiver cannot participate in affect regulating dyadic interactions, the child shows a greater tendency for negative emotional states to endure beyond the initial stressful event. Insecurely attached individuals have poor adaptability to environmental change, negative mood when stressed, and intensity of negative reactions over time and different situations.

As a result of repeated episodes of unrepaired misattunement and dysregulation between caregiver and child, these children come to expect that they will not benefit from the caregiver’s attempts to manage their emotional state or reaction to stress. This is a significant feature of all insecurely attachment individuals. These representations are then stored outside conscious awareness as prototypes of interactions with others (internal working models of insecure attachment). Dysfunction of affect regulation in insecurely attached individuals is most obvious under stressful conditions that call for flexibility and effective affect regulation (Schor, 2003).

The ability to reach out to other people for problem-solving help, support, and comfort is invaluable in dealing with stressful life situations. A disadvantage shared by individuals with insecure attachment styles is their lack of trust in family and friends. Children’s experience with caregivers’ intrusiveness, unavailability, rejection, abandonment, and failure to promote and facilitate affect regulation results in their belief that it is futile to reach out to other people for assistance and support. They cannot count on others to be there in times of need. To reach out to others in managing stress, expression of emotion is essential. Often communication skill in expressing emotion is underdeveloped in insecurely attached individuals. Insecure attachment styles usually involve “hiding” emotional needs because of negative experience with inconsistent caregiver availability and

caregiver failure to encourage children's communication skills for affect regulation. The ability to ask others for help and express emotional needs is less available to insecurely attached individuals, creating a handicap in their management of stress (Kobak, 1999).

Good dyadic affect regulation between caregiver and child builds confidence in children about their ability to transition from positive to negative and back to positive states. This smooth dyadic regulation of affect creates a positive outlook regarding self and others. Insecurely attached children do not experience these successful emotional transitions and develop a more negative view of self and others. The fluidity and flexibility of emotional transactions are not experienced in insecure attachments. A rigid style of problem solving may allow insecurely attached persons to feel some security and direction in facing challenges. However, this rigid style of thinking and navigating life challenges does not allow the flexibility required to effectively think creatively and successfully face the unexpected "curve balls" in life. In general, adults assessed as having an insecure attachment have greater difficulty in managing the vicissitudes of life generally, and interpersonal relationships specifically, than those assessed as securely attached (Shaver & Mikulincer, 2002).

Stressful life situations may trigger a dangerous psychobiological "cycle of fear." When danger is sensed in relationships or life crises, the amygdala and autonomic nervous system (ANS) are triggered within milliseconds to go into "fight-or-flight" mode. Management of triggered reactions by securely attached individuals is very different from the insecurely attached. When faced with a difficult life challenge, securely attached people react with initial fear, but the high levels of anxiety begin to subside as they successfully regulate and modulate the negative emotions. This ability to regulate emotion has evolved from a regulating and safe relationship between caregiver and infant (George & Solomon, 1999). The caregiver has provided much of the modulation of states and has facilitated the infant or child to transition from a positive state to a negative state and back to a positive state. These early experiences with disruption and repair form children's ability to withstand negative states and transition back to a positive state.

Neural connections are firmly developed between the amygdala and orbitofrontal cortex, the area of the cerebral cortex involved in social and emotional behaviors, regulation of body and emotional states and critically involved in the attachment process. These neural connections occur as a result of the caregiver providing secure dyadic experiences of affect regulation, which are internalized as internal working models of attachment. Thompson (1999) wrote that emotion is initially regulated by others, but over the course of development it becomes increasingly self-regulated as a result of neurophysiological development. People with secure attachment

At: Shaver & Mikulincer is 2007 in ref list; please reconcile.

styles can self-regulate and address initial fear and anxiety created by a stressor with a positive outlook. Their internal working model of a helpful other will allow them to turn to other people for help if needed. The ability to think flexibly increases the possibility of problem solving in dealing with the stressor.

A different caregiver relationship may be found in insecurely attached persons' developmental history. As a result of episodes of caregiver–infant dysregulation or misattunement, infants learn to expect that they cannot benefit from the caregiver's participation in management of their affect arousal (Beebe & Lachman, 1988). Their internal working models may contain prototypes of the caregiver as rejecting or unavailable but also one of themselves as unworthy of help and comfort (Bretherton & Munholland, 1999). This internal working model of insecure attachment will preclude turning to interactive regulation and support during times of emotional crisis. Schore (2003) notes that the dysfunction of psychobiological systems is most obvious under stressful and challenging conditions that call for behavioral flexibility and affect regulation. Insecurely attached individuals may face a crisis or stressor by fight-or-flight responses such as volatility, conflict, fear, or dismissive avoidance. None of these responses is flexible and problem solving. Frustration and difficulty in facing life's challenges and interpersonal problems may create an ongoing stress response. Physiological stress responses may be acute or chronic. When homeostasis is disrupted, allostasis, an essential psychobiological coping process, engages to meet biological needs of the moment. Allostasis is the process of achieving stability through physiological or behavioral change and involves the autonomic nervous system, the HPA axis, and the cardiovascular, metabolic, and immune systems, which act to protect the body. It is an additional process of reestablishing homeostasis but one that responds to challenge instead of subtle ebb and flow. Allostasis is a process of maintaining physiological stability through change. Paradoxically, this process can protect and restore as well as damage the body. Allostatic load refers to the cumulative cost to the body of allostasis, with allostatic load being a state in which serious pathophysiology can occur (McEwen & Winfield, 2003).

Two types of allostatic load have been identified. Type 1 is acute and occurs during unpredictable natural disasters, which may stimulate survival reactions. These physiological stress responses are temporary and are related to dealing with the immediate crisis. Type 2 allostatic load and overload are physiological responses to social conflict that may persist over time. In Type 2 allostatic overload, increased energy expenditure fails to be effective in reducing the stressors during life and work (McEwen & Winfield, 2003). Chronic fear of pending interpersonal danger maintains excessive stimulation in the stress response and amygdalar systems,

heightening cortisol, the “stress hormone.” Excessive stimulation of cortisol is associated with Type 2 overload and creates wear and tear on the body. Heightened cortisol is associated with many medical conditions such as obesity, diabetes, hypertension, cardiovascular risks, and high cholesterol.

The element of danger in interpersonal relationship is heightened for insecurely attached individuals. The related possibility of Type 2 allostatic overload with its health risks is important to consider as a reaction to chronic stress of “danger” in relationships. In addition, insecurely attached persons do not trust others to be helpful; their answer to the attachment question, “Can I count on you to be there for me?” is no, maybe, or I don’t know. The lack of trust may lead to social isolation and poor social support systems. In general, adults assessed as having an insecure attachment have greater difficulty in managing the vicissitudes of life generally, and interpersonal relationships specifically, than those assessed as securely attached (Shaver & Mikulincer, 2002).

Au: Sroufe is 1998 in ref list; please reconcile.

Sroufe (1995) conducted longitudinal research indicating that attachment styles tend to be intergenerational with a high correlation between the caregiver’s attachment status and the attachment status of the infant with that particular caregiver. Bowlby (1973) wrote that “the inheritance of mental health and mental ill health through the medium of family microculture ... may well be far more important than is their inheritance through the medium of genes” (pp. 322–323). Belsky (2005) also concluded that the process of intergenerational transmission of attachment status is experiential in nature. He found that the quality of parenting and interactive regulation experienced by children is a strong predictor of attachment style. He also noted that attachment style experienced in adulthood shapes subsequent parenting behavior and facilitates either security or insecurity in offspring.

Au: Shaver and Mikulincer is 2007 in ref list; please reconcile here and throughout remainder of chapter where applicable.

Earned Secure Attachment

Fortunately, insecure attachment status is not necessarily permanent in parent or child. Bowlby (1969) wrote that people could accommodate new information that allows their internal working models to be updated. Thus, people possess the capacity for change in patterns of attachment security over time. Additional research has found that change in attachment status can occur throughout the lifespan. The term *earned secure* attachment has been used to describe individuals who experience malevolent or dysregulated parenting from which an insecure attachment status would be likely to evolve yet instead develop a secure attachment. Although individuals who are securely attached have continuous attachment from early childhood, “earned secure” individuals have risen above difficult early childhood experiences and are later assessed in adulthood as securely attached (Pearson, Cohn, Cowan, & Cowan, 1994).

How does earned secure attachment occur? Although the primary caregiver is most influential in shaping attaching status, most children have more than one caregiver. These caregivers (e.g., grandparents, uncles, aunts, siblings, teachers, mentors) play important roles in shaping children's internal working models predicting security versus insecurity in interpersonal relationships. Earned secures have found meaning in their difficult childhoods, may have found ways to forgive their parents, or could have otherwise defused the emotional impact of the adverse parenting they received (Simpson, Rholes, & Winterheld, 2010). Forming a secure relationship with an additional caregiver may one way of defusing their negative past.

The nature of the relationship needed to develop earned secure status is characterized by repetitive, secure interactions with a significant other (e.g., spouse, family member, teacher, mentor, therapist). Examples of repetitive secure interactions that enhance and create security are (1) attunement and conscious reciprocity, (2) self-reflection and recognition of one's own behavior, (3) attention to nonverbal cues of the other, and (4) recognition of the need to repair disjunctions when they occur. Many others forms of repetitive secure interactions foster the recognition or emotional needs of the other, including touching, speaking, eye contact, and remembering. As these repetitive secure interactions occur, they alter brain circuitry.

Psychotherapy and other secure experiences may accomplish alterations in brain functioning because the orbital frontal cortex retains a capacity for plasticity throughout life (Schoore, 2003). The flexible right frontal regulatory system within the secure, affect regulating environment of therapy (or other important secure relationships) may become more flexible and efficient. This neurobiological change may mediate an expansion of individuals' right hemisphere (allowing affect regulation) and the transformation of an insecure into an earned secure attachment (Phelps, Belsky, & Crnic, 1998).

There are naturally occurring protective factors promoting resilience and development of earned secure attachment. Children live multifaceted lives within multiple contexts (e.g., school peer groups, sports teams, religious organizations). Teachers, mentors, and adult models are available. Each context is a potential source of protective factors that allow and promote earned secure attachment status. Secure mentor relationships may promote more security and foster resilience, creating hope for the child (Egeland, Carlson, & Sroufe, 1993). When a greater sense of security occurs, children may have greater physical and mental flexibility. When children or adults feel more secure, this state is characterized by increased release of the hormone oxytocin, which is an antidote to stress. Oxytocin is a hormone related to good health and a sense of well-being.

Clinical Examples of Earned Secure Attachment

A clinical example of earned secure attachment is Sam, whose primary caregiver was an alcoholic mother. His father was often absent because of his business travel. Whenever he left, Sam felt unprotected from his mother's irrational and unpredictable rage states when she drank heavily. Sam was verbally abused by his mother with name calling, harsh criticism, and verbal attacks in which his mother would accuse him of "bad" behavior. At times he was physically abused when his mother would beat him with a belt or large metal cooking spoon. He reports being fearful and distrustful of relationships during his childhood. When Sam was 11 years old, his parents divorced, and primary custody was awarded to his father on the basis of his mother's alcoholism and abusive behavior. Initially Sam had supervised visits with his mother once a week until his mother proved to the court that she was sober and attending regular Alcoholics Anonymous (AA) meetings. Sam then saw his mother occasionally and only when he chose to see her. His father traveled less and was more physically and emotionally available to Sam. The father's girlfriend, who lived with Sam and his father (and later became Sam's stepmother), was very caring and accepting of Sam and became a secure caregiver. Through the repetitive secure interactions with his father and stepmother from ages 11–18 (when he went away to college), Sam became more trusting and earned secure in his attachments to these primary caregivers. He became more forgiving and understanding of his mother, whose childhood had been marred by her own parents' alcoholism. When Sam attended college he developed mentor relationships with two professors who supported and guided his intellectual growth and success. These were additional secure relationships allowing secure repetitive interactions that also contributed to his sense of earned security. After college he married a woman who served as a secure base and safe haven; together they have created a secure and enduring attachment bond. Currently, Sam is working successfully as a corporate executive. However, he chose not to have children out of a fear that he might not be a "good" parent due to childhood experiences with his abusive and emotionally unavailable mother. We will never know whether his earned secure status could have resulted in his being a secure and loving parent, ending the intergenerational cycle of insecure caregiver transactions.

Janice is another clinical example of earned secure attachment. Earning security has not come easily for Janice. How could it? What looked like a perfectly fine family was part of the problem. On the outside, her family life was quite upper-middle class. Her mother, an artist, was home with the children, and her father had a good job in law. But that is where any semblance of normality stopped. Janice's mother had never resolved her own feelings of hatred for her mother and in turn began to turn away from

Janice almost at birth. Janice, a middle child, lived with daily neglect bordering on actual abuse. In addition, she was left in the care of relatives who furthered this frightful cycle. Because of the profound scorn that Janice's mother had for her father, he was not available to her to offset this cycle of profound neglect. How is it possible then for someone who had such minimal experience with good attachments to survive and grow in a healthy way? But much like a cactus flower in a barren desert, Janice somehow had the implicit instinct to find what she has needed. While she was in college, suffering from extreme addiction, she began therapy with a skilled and sensitive therapist. Even though she did not acknowledge the will to live, she continued to go to therapy, stating unequivocally that she had no idea why she was there. This was the important beginning of building a real relationship with someone who actually listened to her experiences and validated the horror of what she had to live through, allowing repetitive secure transactions over a continuous time span.

Time has passed, and Janice's behavior has shown a new kind of spirit such as her courage to move across the country to make a new life for herself. Gradually, she brought into her life new and meaningful connections including a significant boyfriend, several girlfriends, and a new therapist. She has forged the attachments to these new relationships, and each in its own way has contributed to her building a secure foundation that in the past was illusive at best.

The remnants of Janice's past are most evident in her profound resignation that comes on quickly when life's trials pile up. In those times, her ability to remain present and to not withdraw into a dissociative state are most apparent. Now that Janice has a more secure foundation, she is working on expanding her capacity to emotionally handle the frustration and fear that are part of such stressful situations.

In each of these junctures and transitions in her life, Janice has been able to form new connections with people who are kind, considerate, and present. That includes finding a new therapist who had the opportunity of building on the connections that began in the earlier therapy. Janice's greatest challenge is being able to maintain her sense of perspective and balance when she is being bombarded by intensely meaningful stimuli. She in effect recognizes that she will always have her own vulnerabilities but that they do not have to prevent her engagement in life.

Hope and Earned Secure Attachment

Sam and Janice are two examples of individuals who achieved earned secure attachment status through repetitive and continuous secure experiences with therapists, teachers, professors, mentors, friends, and intimate partners. They have experienced many cycles of organization, disorganization,

and reorganization of attachment schemas, which allowed the creation of a new earned secure attachment style (Schoore, 2003). Children (and adults) can overcome difficult relationships in early life. Relationships with figures of importance in children's lives, which contain repetitively secure interactions, can ameliorate and defuse an earlier, more poisonous relationship with a primary caregiver in early development. Because our brains are capable of new neuronal growth, we can be hopeful about more secure attachment relationships in life leading to the development of an earned secure attachment status that will promote physical and mental well-being. Having the courage to go into these new and different secure relationships is the first step in allowing this change. Taking this risk offers a different outcome relationally from what was experienced in the past. All of this builds the confidence necessary to proceed differently in life and to create more secure relationships.

References

- Ainsworth, M. D. S., Blehar, M. C., Waters, E., & Wall, S. (1978). *Patterns of attachment: A psychological study of the strange situation*. Hillsdale, NJ: Erlbaum.
- Beebe, B., & Lachman, F. M. (1988). The contribution of mother-infant mutual influence to the origins of self-and object relationships. *Psychoanalytic Psychology*, 5, 305–337.
- Belsky, J. (2005). Social-contextual determinants of parenting. In R. E. Tremblay, R. G. Barr, & R. D. Peters (Eds.), *Encyclopedia on early childhood development*. Montreal: Centre of Excellence for Early Childhood.
- Bowlby, J. (1958). The nature of the child's tie to his mother. *International Journal of Psychoanalysis*, 39, 350–373.
- Bowlby, J. (1969). *Attachment and loss: Vol. 1 Attachment*. New York: Basic Books.
- Bowlby, J. (1973). *Attachment and loss: Vol. 2. Separation*. New York: Basic Books.
- Bowlby, J. (1982). Attachment and loss: Retrospect and prospect. *American Journal of Orthopsychiatry*, 52(4), 664–678.
- Bretherton, I., & Munholland, K. A. (1999). Internal working models in attachment relationships: A concept revisited. In J. Cassidy & P. R. Shaver (Eds.), *Handbook of attachment* (pp. 89–111). New York: Guilford.
- Cozolino, L. (2002). *The neuroscience of psychotherapy: Building and rebuilding the human brain*. New York: W. W. Norton.
- Egeland, B., Carlson, E., & Sroufe, L. A. (1993). Resilience as process. *Development & Psychopathology*, 5, 517–528.
- George, C., & Solomon, J. (1999). Attachment and caregiving. In J. Cassidy & P. R. Shaver (Eds.), *Handbook of attachment* (pp. 649–670). New York: Guilford.
- Goldstein, S., & Thau, S. (2004). Integrating attachment theory and neuroscience in couple therapy. *International Journal of Applied Psychoanalytic Studies*, 1(3), 214–223
- Karen, R. (1994). *Becoming attached: First relationships and how they shape our capacity to love*. New York: Oxford University.

- Kiecolt-Glaser, J. K., & Newton, T. L. (2001). Marriage and health: His and hers. *Psychological Bulletin*, *127*(4), 472–503.
- Kobak, R. (1999). The emotional dynamics of disruption in attachment relationships: implications for theory, research, and clinical intervention. In J. Cassidy & P. R. Shaver (Eds.), *Handbook of attachment* (pp. 21–43). New York: Guilford.
- Lewis, T., Amini, F., & Lannon, R. (2001). *A general theory of love*. New York: Vintage.
- Lieberman, A. F., Padron, E., Van Horn, P., & Harris, W. W. (2005). Angels in the nursery: The intergenerational transmission of benevolent parental influences. *Infant Mental Health Journal*, *26*(6), 504–520.
- McEwen, B. S. (1998). Stress, adaptation and disease: Allostasis and allostatic load. *Annals of the New York Academy of Science*, *840*, 33–44.
- McEwen, B., & Wingfield, J. (2003). The concept of allostasis in biology and biomedicine. *Hormones and Behavior*, *43*(1), 2–15.
- Pearson, J. L., Cohn, D. A., Cowan, P. A., & Cowan, C. P. (1994). Earned and continuous security in adult attachment: Relation to depressive symptomatology and parenting style. *Development & Psychopathology*, *6*, 359–373.
- Phelps, J. L., Belsky, J., & Crnic, K. (1998). Earned security, daily stress, and parenting: a comparison of five alternative models. *Development & Psychopathology*, *10*, 21–38.
- Raphael-Leff, J. (1991). *Psychological processes of childbearing*. London, England: Chapman and Hall.
- Sable, P. (2000). *Attachment and adult psychotherapy*. Northvale, NJ: Jason Aronson.
- Schmidt, S., Nachtigall, C., Wiethrich-Martone, O., & Strauss, B. (2002). *Attachment and coping with chronic disease*. *Journal of Psychosomatic Research*, *53*, 763–773.
- Schore, A. (1994). *Affect regulation and the origin of the self: The neurobiology of emotional development*. Hillsdale, NJ: Lawrence Erlbaum Associates, Inc.
- Schore, A. (2003). *Affect regulation and the repair of the self*. New York: W. W. Norton.
- Shaver, P. R., & Mikulincer, M. (2007). Adult attachment strategies and the regulation of emotion. In J. J. Gross (Ed.), *Handbook of emotion regulation* (pp. 446–465). New York: Guilford Press.
- Siegel, D. (1999). *The developing mind: How relationships and the brain interact to shape who we are*. New York: Guilford.
- Simpson, J. A., Rholes, W. S., & Winterheld, H. A. (2010). Attachment working models twist memories of relationship events. *Psychological Science*, *21*, 252–259.
- Sroufe, L. A. (1988). The role of infant-caregiver attachment in development. In J. Belsky & T. Nezworski (Eds.), *Clinical implication of attachment* (pp. 18–38). Hillsdale, NJ: Erlbaum.
- Thompson, R. A. (1999). Early attachment and later development. In J. Cassidy & P. R. Shaver (Eds.), *Handbook of attachment* (pp. 265–86). New York: Guilford.

