

# The Science of Attachment

by *Lauren Lindsey Porter*

Turn on your television. Walk the aisles of a toy store. Peruse the shelves in the baby department. What do you find? Toys to enchant and stimulate. Products to soothe and calm. Videos to enhance intelligence. Games to teach. There is a myriad of merchandise out there, all designed to connect with our babies, magnify their intelligence, and help them negotiate the world. There is also a vast library of advice to go along with the merchandise. Grandparents, pediatricians, friends, obstetricians, and daycare providers, to name just a few, each have volumes to speak on the subject of parenting. The themes that quickly emerge include fostering baby's independence, refraining from spoiling, and encouraging acceptable behavior and sleep patterns. Much of this advice focuses on easing the burden on parents, particularly mothers, who often feel overwhelmed at the arrival of a new baby or the challenges of a toddler. Even for parents drawn to child-centered, attachment-focused childrearing, difficulties arise that cause confusion and questioning, leaving us to wonder if we're doing the right thing. How can you sort it all out? Are there rights and wrongs? If so, how do you find them?

The field of attachment theory provides some answers. Behind the capitalist marketing, beyond the mainstream agenda, beneath the advice of the masses, there exists an extensive, sound, and powerful body of research in the fields of neuroscience, psychology, and infant development. It gives us the answers we seek, but may not be what we want to hear. Our instincts have long told us to meet the needs of our babies, even when we haven't understood how or why. Now compelling cross-discipline, integrative research joins the findings of neurology, psychiatry, biology, genetics, and psychology to hand us the keys to unlocking the mysteries of parenting. This research offers clear evidence that creates a fundamental understanding of why attachment is the cornerstone of infant development, and how to create a secure environment that guides our children to their fullest potential.

Attachment theory began in the 1950s with the work of John Bowlby and Mary Ainsworth. Bowlby, an English psychiatrist, became interested in young children's responses to loss, and began studying the realms of attachment and bonding. He and Ainsworth, an American psychologist who conducted some of the most extensive field research into mother-infant interaction ever completed, formulated what is now commonly known as attachment theory.

Attachment theory is based on the belief that the mother-child bond is the essential and primary force in infant development, and thus forms the basis of coping, negotiation of relationships, and personality development.<sup>1</sup> If the mother is absent or unavailable, a primary caregiver serves the mother's role. Attachment can be defined in both behavioral and emotional terms. From a behavioral perspective, attachment is represented by a cluster of instinctive child behaviors that serve to create the attachment bond, protect the child from fear and harm, and assist in the safe exploration of the world.<sup>2</sup> These behaviors include reaching, clinging, sucking, and locomotion, and all facilitate maximum physical and emotional development.<sup>3</sup>

>From an emotional perspective, attachment is the creation of a mutual bond in which the mother shapes infant development through her interactions and relationship with her child.<sup>4</sup> Babies, who are not born with the ability to decode and decipher meanings and emotions, rely on the mother to help them navigate the world, both internal and external.<sup>5</sup> This relationship allows for the formation of "internal working models" that function as scripts or templates, by which babies can then gauge their own emotions and those of others.<sup>6</sup> As the baby begins to create these internal working models, the mother acts as a "secure base" that is used for exploration, learning, and developing the necessary skills of self-protection and intimacy.<sup>7</sup>

Children consequently develop and display distinct attachment styles, which are loosely defined as either "secure" or "insecure." Insecure styles are hallmarked by features of instability, including ambivalent

behavior, preoccupation, avoidant responses, and a lack of cooperative communication in the mother-child pair. Secure attachments, on the other hand, show a child consistently connected to the mother, with a firmly established sense of trust and an unwavering nurturing response.<sup>8</sup> The development of a secure or insecure pattern is dependent on the mother's attachment to the baby and whether there is attunement in this dyad. In other words, it is the mother's interaction with the baby, and the interplay between that interaction and the baby's needs, that define a child's style of relating. These emotional bonds develop rapidly in infants, and are critical to both infant development and the trajectory of events later in life.<sup>9</sup>

Bowlby approached the study of attachment as a science and included many different disciplines in his approach, including general systems theory, evolutionary theory, ethology (behavioral biology), and descriptive studies of children interacting with caregivers.<sup>10</sup> In each aspect of his research, one fact became overwhelmingly clear: attachment is a biological necessity.<sup>11</sup> At each developmental point, the infant must have a close attachment with a consistent caregiver to ensure protection in the face of both internal changes and environmental stimuli. Attachment is, quite simply, a key to survival.

This theory of attachment has served as the underpinning of parenting experts such as William Sears, MD and the entire modern movement now termed "attachment parenting." While not yet mainstream in our Western society, these resources offer important and thoughtful guidance and reassurance to families seeking to parent in a fully conscious and sensitive manner. Unfortunately, the attachment-parenting baby books and information available are often reduced to a list of practical methods, such as on-cue breastfeeding and wearing your baby. They give sound advice but provide little theory, and even less scientific data, to support the methods described. Additionally, these experts often do not give advice for raising children past the age of two, just when many of the most difficult and confusing aspects of attachment come into play.

In our society, attachment parenting is seen as just another of an array of parenting options, and is typically viewed as the most difficult and least appealing choice. What is missing is the science that modern assessment methods and technology can offer. Now, with the ability to study the intricacies of the brain and its functioning on a cellular level, science can deliver conclusive data to back up each aspect of Bowlby's comprehensive theory, and then some. The data are powerful and offer what no other parenting model puts forward: unbiased and testable information about the workings of the infant brain and the effects of both stress and health on brain development.

>From late pregnancy through the second year of life, the human brain experiences a critical period of accelerated growth. This process consumes higher amounts of energy than any other stage in the lifespan, and requires not only sufficient nutrients but optimal interpersonal experiences for maximal maturation.<sup>12</sup> During this period, the focus is on right-brain development. The right brain is deeply connected to both the sympathetic and parasympathetic nervous systems, which control vital functions that support survival and cope with stress, as well as the limbic system of the brain, which includes the hippocampus and amygdala.<sup>13</sup> The limbic system is the neurological seat of emotions; the hippocampus and amygdala are closely tied to memory and the regulation of emotions, including aggression.<sup>14</sup>

The human cerebral cortex adds 70 percent of its final DNA content after birth.<sup>15</sup> Consequently, the expanding brain is directly influenced by its environment, thus creating an interplay between biology and social environment.<sup>16</sup> With the help of neuroscience and sophisticated use of technologies such as EEG, PET, and MRI, we are now able to see just how this interplay looks. What has emerged is mounting evidence that stress and trauma impair optimal brain development while healthy attachment promotes it.<sup>17, 18</sup>

Just what is stress to an infant? And what is healthy attachment? We now have answers to these questions as well. Babies, we know, cannot survive on their own. All basic needs must be met through a relationship with a caregiver. What this new research tells us, however, is that these needs go far beyond the simple ones of food and sleep, and are intimately tied to the emotional world. Leading the way in integrating the mass amounts of data and compiling them into new theories and explanations is

Dr. Allan Schore, a psychologist at the UCLA School of Medicine. Schore takes us into the world of psychobiology, the intersection of the genetically encoded biological temperament, and the nature of the caregiving experience.

In psychobiological terms, babies are unable to regulate themselves. Despite being born with the capacity for feeling deep emotions, babies are unable to keep themselves in a state of equilibrium, lacking the skills to regulate either the intensity or the duration of those emotions.<sup>19</sup> Without the assistance and monitoring of a caregiver, babies become overwhelmed by their emotional states, including those of fear, excitement, and sadness.<sup>20</sup> In order to maintain emotional equilibrium, babies require a consistent and committed relationship with one caring person. As you might expect, the research indicates that the person best suited for this relationship is the mother.<sup>21</sup>

What is fascinating about the mother-baby dyad is that, like the biology-environment interplay, it is a synchronized system.<sup>22</sup> The mother tunes to her baby's internal states and responds, which produces a response in the mother, which further fuels the system. One is not independent of the other, and each has a profound effect on the next response. This dyad is the key to healthy development for the baby.<sup>23</sup> As Bowlby believed, the mother must achieve attunement with her baby to create healthy attachment. Thus, healthy attachment is simply the development of that attuned relationship.

Attunement, in the simplest terms, means following baby's cues. Babies have their own spontaneous expressions of themselves. When you pay attention to these expressions you communicate that you understand what they are doing, feeling, and even thinking.<sup>24</sup> This assists brain development and creates a foundation for the negotiation of all social interactions. When the mother-baby dyad is in attunement, both will experience positive emotions. If out of sync, the baby will show signs of stress, such as crying, that indicate the need for re-attunement.<sup>25</sup>

To a baby, stress is anything that pulls it out of attunement and into a negative emotional state. Events that cause such painful emotions as fear, anxiety, and sadness create stress. This includes everything from short, unwanted separations from the mother to the extreme of abuse. It is also important to note that stress to an infant is not limited to negatively charged events, but also includes anything new or different. New situations create stress for babies because they have no prior experience of them. Attunement of the mother-child pair in stressful situations creates the self-regulation that babies do not inherently possess. When babies are in balance, they are emotionally regulated, and rely on the relationship with their mother to keep dysregulation at bay.<sup>26</sup> For example, if a mother sets her baby down to answer the phone and the baby begins to cry, the baby requires the mother's return and re-attunement in order to avoid becoming overwhelmed by sadness. Without this assistance, the crying intensifies and leads to a chain of internal reactions that put the baby in a survival mode. In a survival mode, the baby operates at the most primary level, forced to dedicate all resources to the basic functions necessary for existence, thus forfeiting opportunity for potential growth.

This chain of events is a cycle of hyperarousal and dissociation that begins when the baby becomes distressed.<sup>27</sup> The initial stage is one of hyperarousal—the “startle” reaction to a threat. This engages the sympathetic nervous system, which increases the heart rate, blood pressure, and respiration. Distress at this stage is usually expressed by crying, which will progress to screaming. The brain attempts to mediate this by increasing levels of major stress hormones, elevating the brain's levels of adrenaline, noradrenaline, and dopamine. This triggers a hypermetabolic state in the developing brain.<sup>28</sup> Stress hormones are protective mechanisms intended to be used only for short periods of time, to assist the body in surviving a dangerous situation. Prolonged periods spent in this state are damaging. Additionally, prolonged exposure to stress induces increased levels of thyroid hormones and vasopressin.<sup>29</sup> Vasopressin, a hypothalamic neuropeptide, is activated in response to an unsafe or challenging environment.<sup>30</sup> It is also associated with nausea and vomiting, which may explain why many babies throw up after extended crying.<sup>31</sup>

The second, later-forming reaction to stress is dissociation. At this point, the child disengages from the external world's stimuli and retreats to an internal world. This reaction involves numbing, avoidance,

compliance, and lack of reaction.<sup>32</sup> This second stage occurs in the face of a stressful situation in which the baby feels hopeless and helpless.<sup>33</sup> The infant tries to repair the disequilibrium and misattunement but cannot, and so disengages, becomes inhibited, and strives to avoid attention, to become “unseen.”<sup>34</sup> This metabolic shutting-down is a passive state in response to an unbearable situation, and is the opposite of hyperarousal. In biological and evolutionary terms, it is the same process that allows us to retreat from overwhelming situations to heal wounds and fill depleted resources. However, as a response to dyadic misattunement, it is devastating, and the effects of even short periods of dissociation are profound.<sup>35</sup> In this state, pain-numbing endogenous opiates and behavior-inhibiting stress hormones such as cortisol are elevated. Blood pressure decreases, as does the heart rate, despite the still-circulating adrenaline.<sup>36</sup> This ultimate survival strategy allows the baby to maintain basic homeostasis.<sup>37</sup>

When babies are in distress, their brains are at the mercy of these states. This means that all of their regulatory resources must be devoted to trying to reorganize and regain equilibrium.<sup>38</sup> These kinds of biochemical alterations in the rapidly developing right brain have long-lasting effects. In the infant, states become traits, so the effects of such early relational traumas become part of the structure of the forming personality.<sup>39</sup> This is all occurring at a period of time when the brain is at its maximum vulnerability to influences and stimuli affecting growth and development.<sup>40</sup> While this stress reaction is going on, the infant brain cannot develop in other ways, and thus forfeits potential opportunities for learning at the critical period of brain development.<sup>41</sup> Chronic shifts into this cycle can cause impaired brain development and atrophy.<sup>42</sup>

Another largely misunderstood and overlooked aspect of attachment theory and research is the role of attachment and attunement in the older child. Contrary to popular cultural beliefs, close attachment to the mother remains crucially important to children through the toddler and preschool years.<sup>43</sup> As with infants, this attachment is adaptive and serves to ensure the child’s survival and socialization. While the needs shift, the attachment remains key. In toddlerhood, children make great strides in physical ability and locomotion but are still at an early point in the development of necessary self-protective skills. As preschool approaches, the child becomes more autonomous and self-reliant, but remains vulnerable to a wide range of dangers. Thus, attachment behaviors, such as seeking proximity to mother, evincing anxiety when mother moves away, and protesting separation are adaptive mechanisms, not regressive ones.

This adaptive pattern is largely unappreciated by our Western culture and is unfortunately and wrongly labeled “controlling,” “attention-seeking,” or “spoiling.” Multiple studies have found that two year olds maintain as much, if not more, closeness to their mothers as their one-year-old counterparts.<sup>44</sup> Additionally, even by their third birthday, most children evince distress at being left alone even for brief periods.<sup>45</sup> Research suggests that, by the age of four, most children are increasingly comfortable with separations and have less of a need for contact and proximity to their caregiver to maintain a sense of security.<sup>46</sup>

As children continue to age and develop, their needs evolve but their reliance on the attachment system endures. Even adolescence, often viewed as the pinnacle of developmental challenges, has its focus in attachment. Adolescents struggle with the tension between their connection to family and their formation of independence. The foundation built in the early years is the groundwork for this phase of life; if the attachment is secure and established, child and parents can negotiate the events of adolescence with little struggle.

What is also highlighted in the research is the importance of nonmaternal caregivers in the child’s life. While the mother-child dyad maintains primacy because of its psychobiological underpinnings in survival and optimal development, the child cultivates an array of “affectional bonds”<sup>47</sup> that include, most important, the father or partner, as well as other members of the network of close family and friends. Attunement in each of these relationships is intensely important because the child is always taking in new information and being shaped by the world.<sup>48</sup> Just as the mother’s role is to assist in the child’s development, so is the role of every other primary person in the child’s life. While attachment

theory centers on a primary figure, typically the mother, as the bedrock of the child's health and wellbeing, this does not occur in a vacuum, nor to the exclusion of fathers and partners. Often, in the progression of infant development, the initial role of fathers focuses on support of the mother in her attempt to care for their baby. But it does not stop there. As the baby gains in abilities, the father becomes more central, and his role often evolves into the safe launching point for the child's accelerated forays into the external world. In the implementation of attachment theory, the baby is connected to the mother and embraced by the support of many people who influence growth and development differently at each unique stage.

What does all this mean? Healthy attachment via healthy attunement is the key to healthy babies, and healthy babies are the key to healthy adults. However, while the research may be illuminating, it can also sound frightening. It is crucial to remember that the mother-baby dyad is a mutual system. No system functions flawlessly all of the time; each of us will be faced with times when we are out of sync, or in emotional dysregulation, with our babies. The good news is that these periods of misattunement, as long as they are brief and not chronic, appear to be a positive thing. Because the baby is learning self-regulation, short periods of misattunement followed by re-attunement have the effect of teaching resilience. Further, it is speculated that such interactive repair may also be the underpinning of empathy.<sup>49</sup> This cannot be overlooked—it is vital to understanding brain development and to creating realistic parenting expectations. Long periods of disequilibrium, or consistent and repeated short exposures, however, are not beneficial. The long-term effects of such environments are as disheartening as the short-term stress reaction. Research now directly links the early experiences discussed with a predisposition to mental illness of all kinds and impaired functioning over a lifespan.<sup>50</sup> As you can imagine, if a person cannot regulate her or his emotions and is easily overwhelmed by stressful events, healthy coping is unlikely and illness easily sets in.

Yet another body of hopeful research also exists. There is expanding and exciting study on the impact of positive emotional and play states in the mother-child relationship. This research shows that the capacity to create joy, elation, interest, and excitement together with your baby is a key to early healthy development and lifelong physical and mental health. Thus, the focus is not just on the negative impact of stress and the importance of stress avoidance, but also recognizes the central importance of happiness and joy. The child attaches to the regulating mother, who helps maximize opportunity for positive emotions and minimize opportunity for negative emotions, thus creating optimal health.<sup>51</sup>

What this means for parents raising children in today's world is sweeping. We need cultural changes—changes in expectation, in our view of parents, in our definitions of feminism and masculinity, in our economic systems and medical understandings. In its broader applications, attachment theory requires us to rethink most of what our society has taught us. We must let go of old learning and erroneous information in order to re-attune to our own connective instincts. While this cannot be accomplished quickly, what we can do is apply this new knowledge to our own lives.

Sources that advise the use of formula, bottles, and feeding schedules when on-cue breastfeeding is possible can be dismissed. The understanding of breastfeeding as an attachment behavior that not only meets the nutritional and emotional needs of children but helps to fortify the mother-baby dyad is clear. Bowlby himself saw the dual purpose of breastfeeding and viewed the attachment as primary.<sup>52</sup> Equally compelling is the impact of the visual connection facilitated by nursing. At about eight weeks of age, a baby's vision improves, and these early visual experiences play an important role in development. The mother's emotionally expressive face is the most potent visual stimulus a baby encounters.<sup>53</sup> The creation of an intense mutual gaze causes endorphin levels to rise in the baby's brain, producing feelings of joy. This emotional circuit causes the mother's endorphin levels to rise in turn, resulting in an emotional synchronization.<sup>54</sup> Additionally, the skin contact in breastfeeding, and in baby-holding and -wearing in general, assists in this process.

Cosleeping is another important extension of attachment theory. Because of mother-baby proximity, cosleeping allows for a quick response to disequilibrium. Firmly established regulatory aspects of bed-sharing parallel and echo the self-regulatory learning taking place within the attachment framework.

As the work of Dr. James McKenna illustrates (see *Mothering*, no. 114), cosleeping holds key benefits for infant development and survival.

Perhaps most important, behavior-based techniques of child raising, such as sleep training, must be shunned. Given the new body of sophisticated, cross-discipline research on attachment and brain development outlined in this article, it is clear that a baby's willingness to accept sleep training after reportedly brief periods of protest is no less than a cycle of hyperarousal and dissociation responses that is damaging to her or his development. To think that since the infant has passively accepted the new sleep system, the sleep training is thus "successful," is to misunderstand the workings of the infant brain. No longer can we accept the conventional wisdom that babies are merely "exercising their lungs" when they cry; nor can we tolerate interpretations of babies' cries as "manipulation." Babies cry to signal distress and in effort to engage caregivers to help meet their needs and foster their healthy development. It is an attempt at communication, not manipulation. Their goals are survival and optimal development. This is achieved through secure attachment.

Perhaps the most difficult application of attachment theory lies in our own childhoods. Most of us were not raised within the attachment paradigm. We may worry about the choices we have made with our children, or the implications of our own childhoods on our current lives. While the period of rapid brain growth that occurs in the early years is the most vulnerable time, it is not the only time in which brain development can be altered. The brain is a flexible and complex organ that is always capable of new learning. The acceptance, belief, and practice of attachment parenting can be a healing experience for the parent while creating the best possible environment for the child. In the words of Gandhi, "You must be the change you wish to see in the world."

#### NOTES

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## FOR MORE INFORMATION

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#### Organization

Attachment Parenting International, 2906 Berry Hill Drive

Nashville, TN 37204; .

For more information about attachment parenting, see the following past issues of *Mothering: "Natural Family Living,"* no. 100; *"In Their Hands,"* no. 85; and *"The Needs of Children,"* no. 74.

Lauren Lindsey Porter is a clinical social worker by training and the mother of one daughter, Abby (2 1/2). Since having a baby, she has not worked outside the home, focusing instead on raising Abby and on writing. Prior to Abby's birth, Lauren worked for more than seven years as a therapist for children, adolescents, and families healing from trauma and mental illness. Last year, she and her husband, Joel, moved with Abby to Hamilton, New Zealand.