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Attachment and Self-Understanding: Parenting with the Brain in Mind
By Daniel J Siegel
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ABSTRACT: This article is an adaptation of a chapter in a text edited by Marci Green and published by Karnac and is based on the ideas explored in *The Developing Mind: How relationships and the brain interact to shape who we are* (Guilford, 1999) and *Parenting from the Inside Out: How a deeper self-understanding can help you raise children who thrive* (with Mary Hartzell [2003]). It has been summarized in part in the article, *The Mind, the Brain, and Human Relationships* (Gynaecology Forum International, 2003) and published online under the current title by *Enneagram Monthly*.

KEY WORDS: attachment, neurobiology, parenting, relationships, brain development.

Introduction

The word "attachment" can evoke a wide range of responses from parents. For some it signifies a positive experience of the relationship between child and parent. For others, a sense of dread may emerge with the idea that somehow what has happened early in life will determine destiny without hope of liberation from patterns of the past. The old notion that our early life experiences somehow determine our fate can give you a sense of hopelessness: What is the point of learning about attachment if it just tells you that you are helpless to make a change as an adult? The fact of the matter is that this fatalistic notion is wrong. Carefully conducted scientific studies have shown us that it is not what happened to you that matters most in determining how you raise your children; instead, it is how you have come to make sense of your early life experiences that is the most robust predictor of how your children will become attached to you. Amazing, but true! In this writing I will invite you to sit down with me and explore the wonderfully intriguing ideas and accessible practical implementations of the science of attachment.

In my own journeys through medical school and clinical psychiatry training and then into research in attachment, emotion, memory and narrative, I have come to realize how central attachment relationships are in our lives. What has fascinated me over the past ten years, the "Decade of the Brain," is how our understanding of the role relationships play in our day-to-day subjective lives can be profoundly deepened by integrating the objective findings of an array of sciences. By exploring a wide range of sciences, from anthropology to neuroscience, and seeking the convergence of findings that emerges from their integration, we can arrive at a consilient view of the "unity of knowledge" (or "consilience," as E.O. Wilson has used the term [1998]). In the *Britannica Dictionary*, consilience is defined as "the concurrence of generalizations from separate classes of facts in logical inductions so that one set of inductive laws is found to be in accord with another set of distinct derivation." In other words, as in the old Indian tale of the blind men and the elephant, there is a "larger reality" that exists, though any single perspective can only begin to describe one view of that reality. In the approach that we will take, the convergent view of science can be called "interpersonal neurobiology," (Siegel, 1999), emphasizing the range from the interpersonal (such as perspectives from the fields of anthropology, communications, and social psychology) to the neurobiological (such as the views from evolutionary biology, and the domains of affective, cognitive, and developmental neuroscience).

Why interpersonal neurobiology for parents? How does "parenting with the brain in mind" differ in any way from other approaches to helping parents raise children? Do parents really need to know about neurons to raise their children well? The answers to the first two questions, I hope, will be revealed as you read this article. The last question about the brain can be answered simply: "No." Parents do not need to know about the brain. Research has shown that parents do need to know about themselves, not necessarily about neurons. However, I will suggest to you that having a mind filled with up-to-date knowledge about the science of human experience, including the neurobiology of the human mind, can prepare parents to understand both themselves, and their children well.

When my book, *The Developing Mind*, first came out, my daughter was in preschool and I was asked to give a few lectures on parenting and the brain. Mary Hartzell, the preschool director, attended. Mary is an early childhood educator renowned for her superb teaching abilities and her powerful approach to helping parents raise their children by giving respect to their unique experiences. We quickly realized that our approaches were so similar, despite our quite distinct professional backgrounds. The following year we organized a series of workshops for parents. Their response inspired us to put that integration of our perspectives together into a book which we have called, *Parenting from the Inside Out: How a deeper self-understanding can help you raise children who thrive*. The "voice" of that book is directed to parents, speaking frankly to the reader and weaving stories together with personal invitations for self-reflection that are intended to help parents develop a more coherent understanding of themselves, and their children. That understanding, we feel, is deepened when we can blend both subjective, personal reflections with objective scientific knowledge.

WHAT SCIENCE TELLS US ABOUT OUR INTERPERSONAL HERITAGE

We can turn to neuroscience to understand more about our internal subjective and interpersonal social lives. The brain has evolved as a social organ of the body. Mammals are social creatures, with limbic structures that appear to serve the dual purpose of attuning to the social environment while regulating the internal state of the body. A part of our brains called the limbic circuits help us understand the mammalian trait of needing the presence of caregivers to help regulate the physiology of the young infant. As that infant mammal grows, its ability to regulate its own physiology in a balanced manner will develop a more autonomous capacity. Studies of maternal deprivation in rats have shown that permanent alterations in the behavioral and physiological response to stress occur and impact the social functioning of the maturing animal. While infants can be seen in general as being adaptive, research clearly shows how early adverse experience can have negative effects on growing brains that can have persistent effects on functioning (Bremner, 2002).

As primates evolved, they were not only social and tuned into the state of others; they also evolved a mirror neuron system that enabled them to respond to the intentional acts of other members of the species. Mirror neurons are a system that links perception to motor action (Iacoboni, et al, 1999). When an intentional act is witnessed (such as the raising of a cup to drink), the same mirror neuron will fire as when the individual observing the act enacts that same behaviour (raises a cup to drink). By responding only to intentional acts, and not just to motion, mirror neurons reveal the ways in which our minds respond to the intentional state of another being.

With our evolution as humans, we have taken the mirror neurons one step further into the world of representing in a more abstract way the internal state of others. This capacity of having a sense of another's mind has been called theory of mind, mentalizing, mind reading, and mindsight. The capacity for mindsight enables us to see the minds of others and to put ourselves in the 'mental shoes' of another person, something other primates, though they can imitate, apparently cannot do. A number of authors (Baron-Cohen, et al, 1999) have suggested that this representational ability emerged at least 10,000-40,000 years ago, as evidenced in the representational art of the Palaeolithic era. Rather than just an interesting feature of our past, this theory of mind capacity may have been the basis for our capacity to create more abstract representations of the world beyond our social interactions. These emerging capacities may have been the origins of our human ability to consider various abstract possibilities, opening the door to cognitive abilities to manipulate the world of ideas, and objects, beyond our ancestors' wildest dreams. Such representational abilities enable us to communicate with each other in more complex ways and establish the process of cultural evolution.

When we move from a focus on the evolution of our species to the development of individuals in modern life, we can dive into the field of attachment research and ask how family relationships shape the genetically inherited capacity for various mental processes (Siegel, 2001). Attachment research is a field of developmental psychology that examines how patterns of communication between parent and child shape the development of the child in various domains, such as in the social, emotional and cognitive areas. Across all cultures studied, a process called 'contingent communication' is found in which the signals of a child are perceived, made sense of, and responded to in a timely and effective manner. This sensitive form of care-giving enables the child to feel safe and understood, to feel that its needs will be met, and that the parent is a reliable source of nurture and protection.

One can see the "A-B-C's" of attachment (Siegel and Hartzell, 2003) as how the parent attunes to the child enabling her to achieve a sense of bodily balance that then gives rise to a sense of coherence internally and interpersonally (see Table 1). When parents generally provide a sense of predictable contingency, the child feels understood, joined, and a sense of communion between parent and child is established. We can never provide these A,B,C's all of the time-but we can offer them in a "good enough" manner, especially when our children are in need. When we miss such opportunities for connection, we can make timely and effective repair of such inevitable ruptures.

Attachment	Aligning the parent's own internal state with those of the child, often accomplished by the nonverbal sharing of non-verbal signals.
Balance	A child's attainment of balance of its body, emotions and state of mind through attachment with the parent.
Coherence	The sense of integration that is acquired by the child through its relationship with its parents in which the child is able to come to feel both internally integrated and interpersonally connected to others.

Table 1

The ABCs of Attachment (Adapted from Table 6 from Siegel and Hartzell, 2003)

The evolutionary benefit of the attachment system is that it motivates the infant to seek proximity to the parent, especially at times of distress, thus increasing its chances of survival. Beyond proximity seeking, the infant uses the parent as a safe haven, being soothed when upset, and then internalising the relationship with the parent as a 'secure base', giving it a sense of security that enables it to go out into the world to explore. Much of parenting is a balancing act between the child's need for closeness and his or her drive to explore the world. Parents may feel more comfort in one dimension than another, shaping the ease with which a child will feel engaging in intimate dependency and more autonomous exploration.

CONTINGENT COMMUNICATION PROMOTES WELL-BEING AND SERVES AS A SOURCE OF RESILIENCE TO STRESS

Attachment research has demonstrated that parents, at least in the Western cultures studied, reveal characteristic patterns of communication with their children that promote specific forms of adaptation. With contingent communication, the child develops a secure attachment that promotes well-being and serves as a source of resilience to stress. With various forms of non-contingent communication, the child may develop one of what are called "insecure" forms of attachment. With an emotionally impoverished relationship, the child may develop an avoidant attachment, predictive of later difficulty relating to peers and having a well-developed autobiographical sense of self. If the parents are inconsistently available for sensitive, contingent communication, then the child may develop an ambivalent attachment predictive of later uncertainty and anxiety in social situations. These two forms of insecurity from sub-optimal parenting are organized adaptations, quite distinct from the next form of insecurity, called disorganized attachment.

When the parent is the source of terror and alarm, the child may develop a disorganized attachment predictive of later difficulty with social relationships and balanced emotional regulation. Children with this form of insecurity have been shown to develop the clinical finding of dissociation in which normally associated cognitive processes, such as consciousness, emotion, and memory, become disassociated or fragmented. Dissociation and social difficulties associated with disorganized forms of attachment are possible risk factors for developing post-traumatic stress disorder if an individual is exposed to an overwhelming event in the future. In this way, by the parent creating a state of alarm in a child, the child is presented with a 'biological paradox': its brain motivates it to move toward the caregiver for soothing, but this parent is the very source of its alarm. This is what researchers Main and Hesse (1990) have called "fright without solution."

Why would parents act in ways that were not helpful to their children? To answer this question, attachment researchers devised a set of questions called the Adult Attachment Interview, or AAI, that asked parents to reflect on the nature of their own childhood experiences. The coding of this research instrument involves an analysis of not only what is reported to have occurred but also, more importantly, how the story is told (Hesse et al, 2003). The AAI findings can predict, even in a pregnant couple, what the attachment status of the child will be to each parent (see Table 2). This finding supports the general notion that attachment is a measure of a child's experience, not a function of genetics or other constitutional feature of the child. The AAI reveals that the characteristic ways in which parents remember, the coherence of their autobiographical story, is actually the most robust predictor of the child's attachment to them.

What does the coherence of the adult's narrative actually mean? A coherent life story is one in which the adult has made sense of his or her own childhood experience and has insights into how that past has influenced his or her development as an adult and as a parent. Making sense is revealed in a flexible and reflective narrative that is predictive of that adult's child having a secure attachment. In contrast, a narrative without much access to autobiographical detail or sense of how the past influences the present is associated with a parent of a child with an avoidant attachment. Parents with 'leftover issues,' who have emotional themes that intrude on the present as they attempt to tell the story of their lives, have children who are ambivalently attached to them. Children with disorganised attachment have parents with the important finding of unresolved trauma or loss.

Right and Left Modes of Processing (Adapted from Table 2 from Siegel and Hartzell, 2003)

b. Emotional communication between parent and child involves attuned communication that enables a parent to share and amplify positive emotions and share and soothe negative ones. Contingent joining creates a sense of emotional integration, a feeling that one is inside the mind of another. This sense of communion is at the heart of secure attachments. "

c. Leftover issues can preoccupy parents' minds and interfere with the creation of a sense of joining between parent and child. Parents' defences can distort their accurate perception of their children's signals. Without self-reflection, such preoccupation and create a feeling of ambivalence within the child that may make them anxious to explore the world beyond their homes.

d. Emotionally disconnected patterns of earlier adaptation on the part of the parent may involve a blockage of a parent's access to his or her own right hemisphere processes. Such a "way of being," if remaining unchanged, can be a source of impaired stimulation of the child's own right hemisphere. The resultant inhibition in the development of right hemisphere bodily, emotional, and interpersonal processes may shape the child's own development of a rigid pattern of avoidance in the world.

e. For parents with unresolved trauma or loss, patterns of interacting that have resulted in frightened or frightening behaviour with the child may be at the root of the development of the child's disorganized attachment with that parent. One proposal that may explain this process is the notion of a "lower mode of processing" that will be described in detail in the next section. In this state of mind, the usual higher, integrative functions that enable attuned empathic interactions is temporarily suspended. Responding to these terrifying states leads the child to develop a disorganized attachment. It is imperative that parents become aware of these processes and receive the support they need to help reduce them and resolve their own unresolved issues.

THE LOW ROAD

The integration of clinical observations, parental reports, and neurological and neurobiological studies point to an explanation for how unresolved trauma and grief in a parent may produce the frightened, frightening, and in other ways alarming and disorienting parental behaviors that lead to disorganization in the child. Here is the proposal.

When the higher parts of the brain, the neocortex including its prefrontal region, are integrated with the limbic (emotion, memory, motivational) circuits and the lower regions (the brainstem that brings in input from the body and regulates states of arousal), the brain as a whole is able to achieve a highly adaptive "higher mode" of processing. With such integration, the processes of reasoning, self-understanding, attuned communication, empathy, and morality are achieved. This can be called the "high road."

In contrast, the brain is capable of sudden shifts into altered states of activation. These states of mind can happen quite rapidly, involving changes in our focus of attention, the skills we are primed to utilize, the perceptual biases we engage, the memories we retrieve, and the behaviors we enact. This is the normal shift in state of mind that enables us to be adaptive and flexible to a changing environment. But there is a form of state of mind shift that has a less adaptive quality. If the prefrontal regions of the brain become temporarily disengaged, shut-off from performing their usual integrative functioning with the limbic circuits and the brainstem, then the brain enters a lower mode of processing. In this "low road" the higher processes of reasoning, self-reflection, attunement, empathy, and even morality may be temporarily suspended.

Most of us have the potential to enter the low road. Certain conditions, such as being tired, hungry, or "at the end of our rope" may increase the likelihood of entering such a lower mode of response. Our proposal is that unresolved trauma or grief involve the low road such that it a) becomes triggered more easily, b) is entered more rapidly, c) when entered, remains longer, d) involves more harmful behaviors, e) is more difficult to recover from, and f) when recovery occurs, repair of the disconnection-making a reconnection with the child-is less likely to occur.

This situation would create for the child a terrifying, abrupt shift in the parent who might otherwise be quite accessible and attuned to the child. The innate drive to move toward the attachment figure for soothing only to find that it is this parent who is the source of distress yields a disorganized response. Because of the lack of repair, it may be especially difficult to make sense of the state of alarm and the disorganization that the child has repeatedly entered.

Parents can learn to become aware of their low road experiences. Steps to altering these patterns of entering the low road, creating terror for a child, and then not repairing such disorienting disconnections can also be taught to parents. It is imperative that we understand that even parents who have the best of intention for their children, who love their children dearly, can have unresolved trauma or loss that makes them prone to these disorganizing low road behaviors. Parents in our classes who realize that they are NOT going "crazy" but instead are normal people with unresolved issues, are profoundly relieved to gain insight into these otherwise confusing shifts in their mind's functioning. Previous shame and guilt can give rise to compassionate self-understanding that promotes changes in low road processes and enhances the parent's move toward repair with the child.

Almost ironically, knowing about the brain can increase our understanding of our emotional subjective and interpersonal lives. Bringing this knowledge to parents has been an exciting and profoundly rewarding experience.

We are at the very beginning of discovering the unity of knowledge across a wide array of scientific disciplines that can help us understand the neural processes underlying how relationships may help or hurt children's development. We do know enough now from the independent fields to state that what parents do, matters for children, and what parents do, seems most influenced by how they have come to make sense of their lives. It is not just what happened to parents as children themselves that is the key, it is how parents have come to understand the impact of those events on their own lives that matters most. When parents have a compassionate understanding of themselves they are able to provide the emotionally sensitive, contingent communication that children need in order to thrive. While future research may deepen our understanding of the specific mechanisms by which relationships promote mental health, for now we can build on the emerging view of the social brain to help others and improve the social world in which we live.

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Daniel J. Siegel, M.D.

Daniel J. Siegel, M.D., received his medical degree from Harvard University and completed his postgraduate medical education at UCLA. The author of the internationally acclaimed book *The Developing Mind*, a pioneering work on neurobiology and attachment, he is currently in private practice and is associate clinical professor of psychiatry on the faculty of the Center for Culture, Brain, and Development at UCLA.

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