Graduation Address Santa Barbara Graduate Institute

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Full Text: Headnote KEY WORDS: Prenatal and perinatal psychology, attachment, neuroscience, emotion, self-regulation, somatic psychology Faculty, students, and guests, It is a privilege to be here with you celebrating this graduation ceremony of Santa Barbara Graduate Institute. This day is an important and meaningful event, not only for those who have worked so diligently to become scholars in their fields, but also for this institution, which stands in a unique position of offering doctoral degrees in areas of knowledge that are central to understanding the human condition, prenatal and perinatal psychology, and somatic psychology. Indeed, we are now in the midst of a very dynamic and productive period in the growth of knowledge in the health and life sciences, and the Institute is well poised to produce scholars who can deepen our understanding of a fundamental problem of science, human development. This problem of development happens to also be of interest to me. By coincidence, it is now exactly ten years that I wrote a book on this topic. In the very first paragraph I stated the theme of the next 700 pages of science. In a deliberately rather bold tone I wrote, The understanding of early development is one of the fundamental objectives of science. The beginnings of living systems set the stage for every aspect of an organism's internal and external functioning throughout the lifespan...The child's first relationship, the one with the mother, acts as a template, as it permanently shapes the individual's capacities to enter into all later emotional relationships. These early experiences shape the development of a unique personality, its adaptive capacities as well as its vulnerabilities to and resistances against particular forms of future pathologies. Indeed, they profoundly influence the emergent organization of an integrated system that is both stable and adaptable, and thereby the formation of the self. My friend and colleague, Henry Krystal, put this central organizing principle of the human experience more poetically: We are looking at the foundations of the human soul, those developments which are as essential as the foundation of a house, and as invisible when all is well. As you are well aware, a paradigm shift is now occurring in the basic sciences that underlie prenatal, perinatal, and somatic psychology. Attachment theory, initially proposed by the child psychiatrist-psychoanalyst John Bowlby as a psychobiological conception of the mother-infant interaction, has now become the dominant model of human social-emotional development available to science. In his 1969 classic volume the pioneering Bowlby offered a survey of the essential topographic landmarks of the uncharted territory of the mother-infant attachment relationship, an evolutionary mechanism common to both humans and animals. Although Bowlby's original integration of child psychology, psychiatry, and psychoanalysis with behavioral biology occurred within a period when behavioral psychology was the dominant force in science (Skinner had warned against speculating about what goes on within "the black box"), Bowlby, referring to Pribram's seminal work on the frontal lobes, posited that attachment mechanisms were specifically located in the brain. Over the next four decades attachment theory has acted as a framework and catalyst of interdisciplinary research, and this trend has spawned an extremely large body of developmental studies. The current intense interest in a number of disciplines in developmental research, at various levels of analysis, has both dramatically expanded the amount of factual knowledge and significantly altered the theoretical constructs that model the etiologies and treatments of the psychological and physical disorders of infancy, childhood, and adulthood. This paradigm shift, now occurring within and perhaps more importantly between the basic sciences, is expressed in three converging trends, and it is strengthening the ties of prenatal and perinatal psychology to the allied fields that border it - developmental neuroscience, developmental psychology, and infant psychiatry. The first theme of the paradigm shift arises from the remarkable expansion of studies from neuroscience, the

wealth of data that began in the last decade, the "decade of the brain." Contemporary neuroscience is becoming very interested in the early development of the brain, and indeed in the process of development itself. Neuroscientists and psychologists are all asserting that the most powerful conception of development may come from a deeper understanding of the brain's own self-organizing operations. An intense focus has been upon the human brain growth spurt, which begins in the last trimester of pregnancy and continues to 18 to 24 months of age, the exact interval of human development studied by pre- and perinatal psychology. The myelinization of the brain is so rapid and extensive at this time that the brain not only more than doubles its size, but takes on an "adult-like" appearance at the end of the first year. Neuroscientists are concluding that the accelerated growth of brain structure during critical periods of infancy is "experience-dependent" and influenced by "social forces," while neuropsychiatrists are referring to "the social construction of the human brain," and positing that the cellular architecture of the cerebral cortex is sculpted by input from the social environment embedded in the early attachment relationships. Perhaps the most profound discovery is that we are now describing the brain as a relational brain. And so research and clinical practice is guided by the principle, "the self-organization of the developing brain occurs in the context of a relationship with another self, another brain." This finding gives new meaning to the assertion of the pediatrician-psychoanalyst Donald Winnicott that there is no infant without the mother. The inclusion of data from affective and social neuroscience into updated models of development has engendered a new perspective of the nature-nurture problem. Very recent models hold that development represents an experiential shaping of genetic potential, and that early experiences with the social environment are critical to the maturation of brain tissue. Thus, nature's potential can be realized only as it is facilitated by nurture. Furthermore, more than ever before we now are aware of the importance of the fact that "the brain" is actually a system of two brains, each with very different structural and functional properties. Of particular interest to both pre- and perinatal psychology and somatic psychology is the right brain. This early developing right brain is in a growth spurt in the first two years, before the verbal left, and is dominant in the first three years of human life. This growth is not totally encoded in the genome, but is indelibly shaped by the emotional communications within attachment transactions. In light of the fact that the right hemisphere is dominant for the emotional and corporeal self, the social experience-dependent maturation of the right brain in human infancy is equated with the early development of the self. Early development of the brain, - mind, - body, the origin of the self, is essentially a reflection of the development of the right brain and its emergent functions. Thus, current studies of how the first human relationship permanently impacts the early developing right brain represent explorations of the terra incognita of the essential beginnings of the human experience. The second theme of the interdisciplinary paradigm shift emerges from current transformations within the psychological sciences. All subdisciplines within psychology, from developmental psychology through abnormal psychology, are beginning to change their focus from verbal cognition to nonverbal emotion. Developmental psychological research suggests that more so than the development of complex cognitions, the attainment of an attachment bond of emotional communication and the maturation of affects represent the key events in infancy, and so models have moved from Piagetian theories of cognitive development to psychobiological models of social-emotional development. Clinical psychology, psychiatry, and psychoanalysis are all now emphasizing emotion as a central force in psychopathology and psychotherapy. This focus on psychobiological emotional processes by necessity has finally moved us into the body. Because affects are bodily expressions, we are now in a position to strengthen the theoretical models that lie at the foundation of somatic psychology, complex psychoneurobiological models that can elucidate the etiology of not only psychiatric but also psychosomatic and medical disorders. This rejoining of brain/ mind/body allows us finally to bypass what Damasio calls "Descarte's Error" - the separation of the operations of the mind from the structure and operation of a biological organism, the body. Neuroscientists are now stressing that "The brain is but one component of the complex system that is the body. We take in information and interact with the world through our bodies, and our bodies change with - and in some cases change - cognitive and emotional processing." The third trend of the paradigm shift revolves

around one of the few theoretical constructs that lies at the core of literally every biological and psychological discipline - self-regulation. The process of development itself is now thought to fundamentally represent a progression of stages in which emergent adaptive self-regulatory structures and functions enable qualitatively new interactions between the individual and the social environment. We now know that the maturation of the neural mechanisms involved in self-regulation is experience-dependent, and that these critical experiences are the early social experiences embedded in the attachment relationship. In other words attachment relationships are essential because they facilitate the development of the brain's self-regulatory mechanism. Furthermore, studies now reveal that these essential self-regulatory structures are located in the right brain. And so a consensus now indicates that attachment can be fundamentally defined as the dyadic regulation of emotion, that the attainment of the self-regulation of affect is a major developmental achievement, and that normal development fundamentally represents the enhancement of self-regulation. Echoing these conceptions, a very recent NICHD study concludes "Self-regulation in infancy is best conceptualized as a quality of the infant-caregiver relationship, rather than a characteristic of the infant alone." The three trends of the paradigm shift - new data from studies of right brain development, an emphasis on emotion, and models of self-regulation - are converging to produce clinical models that are directly relevant to pre- and perinatal, as well as somatic psychology, specifically, psychobiological models of the development of mental (and physical) health and illness. The interdisciplinary field of infant mental health is now focusing upon "infant social-emotional development, caregiver-infant interactions, contextual and cultural influences on infant and family development, and all conditions that place infants and/or their families at risk for less than optimal development." In a Special Edition of the Infant Mental Health Journal entitled "Contributions from the Decade of the Brain to Infant Mental Health", I and my colleagues offered a series of articles to demonstrate that early interpersonal relationships, for better or worse, profoundly and indelibly impact the psychological, physiological, and neurobiological aspects of the early development of the self, and that this conception substantially alters our view of human infancy. Science's quest into the mechanisms that underlie human nature by studying the brain began in earnest in the mid-nineteenth century, and at its very onset it became obvious that beneath the skull there are two structurally segregated, yet intercommunicating, brains. One of the first observations made about brain structure-function relationships was that the left cortical hemisphere is specialized for linguistic functions and the right with affective processing, that there were dual brains. This fact underscored something so fundamental about the human experience that it could not be ignored. And so an attempt was made then, and continues now, to understand the meaning of the unique structure-function relationships of the anatomically distinct right and left brains. This continues today in studies that attempt to understand how each acts as an independent entity, yet to also understand how their structure-functions relationships are altered when they organize to become a single system, "a brain", "a mind." The matter of brain duality, in turn, bears upon a continuing interest in the neuropsychological concept of "dominance," a concept that also touches upon the question, what, in essence makes us "human?" To this date, science continues to speak of the left hemisphere's specialization for the analytical, sequential, linear processing of verbal-linguistic information as the explanation for the "dominance" of the left brain. The left hemisphere, the conscious mind, the organ of language, is thus seen as the essential mediator of the human experience. But over the 10 last years neuroscience has firmly established that the right brain plays a central role in organizing, at levels beneath conscious awareness, a number of fundamental psychobiological processes that allow for optimal human activities: the regulation of fundamental physiological and endocrinological functions of the body, the control of vital functions that support survival and enable the organism to cope with stress, the storage of early attachment experiences and internal working models that encode strategies of affect regulation and guide the individual in his interactions with others, the generation of the most complex representation of the sense of the physiological condition of the body, the ability to empathize with the emotional states of other humans beings, the mediation of processes that underpin moral development, the cerebral representation of one's own past and the activation of autobiographical memory, and the capacity

to self-reflect and "mentally travel through time". It is undoubtedly true that adaptive internal and external functioning involves the activation of both right and left brain processes. But I suggest that the right brain is "dominant" in humans, and that the most fundamental problems of human existence can not be understood without addressing this primal realm. I want to end with a few thoughts about the larger implications of these advances in science for each of us, and for all of us. In my introduction to a Special Edition of the Infant Mental Health Journal I described the current debate in American society, channeled through the broadcast and written media, about the importance of the first three years of human life. Neuroscience has been designated the central arbiter of the debate, and a number of current authors, each highlighting certain very prescribed areas of developmental neurobiology and developmental psychology, are now painting what they see as brain-mind portraits of infants. The different portraits of each of these writers, in turn, reflect different images of infancy that are prevalent in current society. How we, as adults, "see" our infants, how we attempt to understand the baby's structural development and expanding functional capacities and potentialities, is biased by the lenses of our own individual life experiences as well as by the filters of the culture in which we live. These unique and shared biases strongly influence the subjective perception of our infants as relatively independent or fundamentally dependent on adult caregivers, as passive or active agents, as open and plastic or closed and fixed systems, as durable or fragile biological organisms, and as cognitive machines or feeling, sensate beings. But perhaps the greatest point of difference in the debate is the question of mind - since infants have no verbal abilities, are they mindless or do they possess a communicating, developing consciousness? These different images of the earliest stages of humanhood are critical because they contain within them the representations of our possible futures - they model the potential developmental extension of our individual and collective social identities. The ongoing debate of different theories of brain-mind development in turn is tightly coupled to the pragmatic issue, when and where shall we place our current resources in order to optimize the future of human societies? And so we turn to science, and particularly to our most recent and powerful brain technologies to offer us more "objective data" on the matter. The interpretation of this data will have extremely important social, political, and economic implications. How much should we value the very beginnings of human life, in tangible social program dollars? The vast amounts our society spends on defense budgets and medical research is specifically directed towards allowing each of us to feel secure, in mind and body, in our everyday life. This matter of inner security is clearly a psychological state. Even though an internal sense of security is a desirable, indeed longed-for state, it can not be imposed upon a passive individual. Rather, external and internal conditions must be appraised in order for the self system to actively create and maintain the internal sense of safety that comes from the implicit knowledge that one can cope with the various stressors that inevitably accompany human existence. It is now clear that the development of the critical capacity to create and maintain an internal sense of emotional security comes from the inner, not necessarily conscious knowledge that during times of stress, one can cope, either by autoregulation or going to others for interactive regulation. Developmental psychology and neuroscience are now converging to show that this adaptive ability is essentially established in the three first years of human life, and that it is the product of our early attachments. The intense interest in early development in every discipline of the mental health field strongly suggests that further interdisciplinary research will lead to increasing amounts of information that are directly translatable into the creation of more effective programs of early prevention, programs that impact the trajectory of development over the course of the entire lifespan. Current developmental conceptions that integrate the psychological and biological realms are bringing us closer to a complex biopsychosocial model that can serve as a source of not only the next level of questions for science, but pragmatic applications of this knowledge. These deeper investigations of infant mental health, of the primary forces that impact the development of human nature, can do more than alter the intergenerational transmission of psychopathology, they can significantly increase the numbers of individuals who possess an intuitive sense of emotional security, and thereby the quality of life of the infant, child, and adult members of our societies. Thirty-five years ago John Bowlby ended his classic volume Attachment with the following words:

The truth is that the least-studied phase of human development remains the phase during which a child is acquiring all that makes him most distinctively human. Here is still a continent to conquer. Graduates, students, faculty, and fellow explorers - here is a noble goal of a life's work. AuthorAffiliation Allan N. Schore, PhD AuthorAffiliation Address presented July 23, 2004 at Santa Barbara Graduate Institute's graduation celebration, Santa Barbara, CA. Correspondence: Allan N. Schore, PhD, Department of Psychiatry and Biobehavioral Sciences, University of California at Los Angeles, David Geffen School of Medicine. 9817 Sylvia Ave., Northridge, CA 91324. Email: ANSchore@aol.com.

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