ARTICLE

WHERE ARE WE GOING IN THE FIELD OF INFANT MENTAL HEALTH?

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One of the fascinating actualities of the present day is the diversity of disciplines that are converging at the crossroads of infant mental health—biology, neuroscience, physics, genetics, obstetrics, neonatology, pediatrics, psychology, psychiatry, sociology, anthropology, linguistics, et cetera. It will be the collaboration among talented minds drawn from each field, with communication across disciplinary boundaries, that will determine where we are going in the field of infant mental health. The task of integrating a huge amount of information on many different levels is obviously one of enormous complexity. I will attempt only to open discussion on the subject by presenting my own point of view and the areas of special interest to me. In presenting their particular viewpoints, the 10 additional contributors to the issue will provide the reader with the opportunity to experience both the complexity the question entails and the wide variety of perspectives that can be constructed on it.

At the simplest but most inclusive level, I view the field of infant mental health as holding the key to the future, the future of both individual development and larger social organization. Infancy lies at the intersection of multiple and powerful forces that, in shaping the present, shape the future. It is at this intersection that, through careful study, the complexities essential to life process at the human level can be sorted out, from the evolutionary–biological to the organization of consciousness and self-awareness. As we gradually gain a more comprehensive understanding of life process and the role our awareness plays in implementing its principles, we will be able more effectively to optimize that elusive state we call *health*.

Central to the sorting out will be the unraveling of the long-term effects that each individual infant's early experiencing has upon the unique configuration of his or her developmental course. We are already beginning this task by changing the way we think of process in the living system. The traditional linear, cause–effect perspective is changing to the far more inclusive, nonlinear, dynamical-systems way of thinking. We are moving from a one-person focus for the understanding of developmental change in human personality to an understanding of change in the individual as part of a larger, systems process of change, within which the changing individual is but a part. *Inclusiveness* from this perspective requires us to include new understanding of the way the brain functions and the way its developing morphology is being shaped by the actualities of the infant's experiencing. This is a structure–function connection of profound significance for the longer-term developmental course. Sensitivity to initial conditions, a basic parameter of the nonlinear dynamical system, suggests that our search must

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begin with an understanding of the functional organization of the infant-caregiving system from its earliest beginnings. The way order and unity emerge from the extraordinary complexity of the living system suggests we seek, similarly, to comprehend the way coherence in the organization of consciousness emerges in the infant's developmental process. Microsecond interactional analysis now provides a tool to examine the role the focus of attention of each partner plays in this organizing process, both as enacted and experienced by each. A clearer understanding of sequence, consequence, and context, in one's experience of another's focus of attention—setting the stage for one's experience of personal recognition—can be explored. The role played by direction, intention, and meaning in the way the brain organizes its adaptive function from the very outset will be elucidated as infant mental health moves to the future.

There are five topics suggested by these introductory comments that I would like to enlarge upon as future directions that the field of infant mental health will pursue. The first topic—systems thinking—emerges from the shift in our thinking from its focus on the health or impairment of the individual to the greater inclusiveness that is possible when we think in terms of the system of which that individual is but a part. We seek for better understanding of the principles governing the optimal functioning of infant-caregiving systems, given the uniqueness of each individual and the diversity of sociocultural contexts within which infant development is occurring. The second topic that will have a profound influence on the future will be the clarification of the relationship between early infant experiencing and its role in shaping developing brain morphology. The way enduring themes of organization, constructed as meaning, purpose, and/or direction, emerge in a new life will inform our larger society of the place for infancy that needs to be recognized (Hoffman, 1997). A third step which immediately follows the second, concerns the imperative need to resolve the debate that surrounds the evidence for an initial sensitive period in the pre-, peri-, and early postpartum period. From the systems perspective, these are initial conditions in the emergence of infant and caregiver as a new system, as well as the conditions that shape neurophysiological roots that will underlie the infant's potential for attachment and subsequent development. A fourth direction infant mental health is taking, and will be taking ever more explicitly in the future, is the study of the way adaptation between the unique infant and its own unique caregiving system, or their fitting-together, is actually negotiated over the first 3 years of life. This is a process that shapes both the infant's repertoire of adaptive strategies (or procedural knowledge), as well as its organization of attention, expectancy, and self-awareness—its organization of consciousness. If we are to optimize the unique potentials for healthy later development of diverse infant-caregiving systems, it is here that our effort to define essential principles of that process must be centered. The author's previous work has proposed that the specificity achieved in a recognition process will play a critical role in the infant's emerging awareness of self-as-agent and the infant's sense of validity of self, which it gains as adaptation with its caregiving system is negotiated. The fifth topic is one that holds a vast potential that we are just beginning to realize. The diversity among the societies and cultures of the globe in the way infant mental health is conceived, implemented, optimized, or derailed, offers an enormous resource for new research by the study of such diversity, as we seek to define common principles in the human developmental process. The increase in global agencies committed to improving infant mental health worldwide will facilitate new access for empirical study of the systems perspective on developmental process. It will provide the opportunity to gain new experience in designing effective intervention programs, and in tracing longer-term outcomes from a diversity of initial conditions. Let us look further at each of these glimpses into the future.

THE SYSTEMS PERSPECTIVE

In the last two decades the language of systems thinking—emerging from chaos, complexity, or nonlinear dynamical systems theory[1] has not only provided a new vocabulary for description of complex processes, but has also introduced a whole new way of thinking about the relation between cause and effect, about self-organization and emergent properties, and about the flow of sequence and consequence in describing process and change. We must look not just at the health or functioning of the little baby brought to us in the office, but at the complex organization of the whole support system of which the infant is but a tiny part—for it is playing a most powerful role in defining the context to which each infant must adapt—each in his or her own unique way. As we try to define the words of our initial question, "Where are we going in the field of infant mental health?," we must ask, what do we mean by *infant mental health*—or by *infant?* Are we talking about a newborn or a two-year-old? A systems perspective on infant mental health would want a broad view of the way that infant is surviving, over time, within its particular context of life support. A system that doesn't work often can be described more easily than one that does. Our communication will be greatly facilitated when we can succinctly define the principles of process in an infant-caregiving system that works in providing the context for optimal infant mental health, in spite of the wide spectrum of differences between systems and the presence of the myriad of obstacles that can interfere.

It is important to keep in mind that our focus upon the infant and its caregivers concerns a special instance of systems thinking, namely, that of the living system. The living system is a special instance, exemplifying nonlinear dynamical systems processes, but having certain essential features in addition. Among these are two proposed by Von Bertalanffy (1952), an early contributor to systems thinking, namely, *organization* and *primary activity*. *Primary activity* refers to the fact that the flow of energy shaping the matrix of complexity that constitutes the organism, arises endogenously from *within* the organism, and is not imposed from without, thus leading to the description of the living system as one that is self-regulating, self-organizing, self-correcting. The exercise of the initiative to act in the self-organizing process we call the *agency* of the organism. In the human, the experience of a sense of the validity of one's self-as-agent in one's own self-regulation and self-organization is an essential feature of mental health. The self-organizing infant seizes opportunities for initiation, exploration, and discovery. Self-organization in the nonlinear dynamical system exhibits new emergent properties when the system is in a state of relative equilibrium. Such emergent properties reflect the expression of the individual's singularity, as Thelen has demonstrated (1994).

Organization refers to the coherence, or unity of the whole of the living system, that is, of the complex matrix of its component parts. Organization holds together the complexity of components through the specificity of connections between them, the whole being formed of a hierarchy of connected subsystems (Weiss, 1970). Part is related to part, part to whole, and whole to part, in the state of *coherence*, which provides the integration or unity essential for

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[1] Systems thinking provides tools for the description of *process* in matrices of great complexity. *Process* in the nonlinear dynamic system can be described in terms of a simple metaphor, as the flow of energy through a matrix of sufficient complexity that is being constrained under different parameters. The energy flow emerges as a flow of recurrent pattern among the constituents of the matrix, each recurrence of pattern having features of both self-similarity and singularity. The trajectory of the flow of pattern is highly sensitive to any change in initial conditions, and is subject to sudden shifts, or points of bifurcation, as change continues in energy flow, complexity of components, parameters of constraint, et cetera. The work of Thelen (1995) on the development of motor skill in the infant provides a clear and most useful example of the way systems thinking may be translated to developmental process and applied empirically.

life, at the level both of the organism and the organism within its ecology. In the living system it is the coordination among components and their relation to the whole that holds the complexity of the living organism together. Such coordination must be enduring, if life is to continue over time. Viewed from the systems perspective, the state of coherence of the whole is an essential feature of the state of mental health. The important work of Main, Kaplan, and Cassidy (1985), using the Adult Attachment Interview of the mother, and analyzing the material in terms of her *coherence variable*, finds it predictive of the security or insecurity of attachment that the as-yet-unborn infant will have at the end of its first year of life. This is a profound illustration of the significance in the developmental process of the parameter of coherence of organization at the system level.

A key question for the future of infant mental health surfaces at this point. To what extent can the genetic potentials of an infant brain be augmented or optimized through the experiences and activities of that infant within its own particular caregiving environment? The mushrooming field of genetic research, in unraveling the complexities of personality and character organization, promises a great resource. But just how such genetic information will be used or will shape the future of infant mental health is not clear at the present. How much should a parent, or child, know about the genetic determinants of the child's temperament, his risk-taking tendencies, his aggressive or passive response style? If life process is to be perceived as that of self-organizing nonlinear dynamical systems in ongoing processes of change, to what extent can such genetic settings on the trajectory of an individual life course be shifted in the developmental process toward more optimal outcomes? What will be required? The future of the field of infant mental health will address these questions.

EXPERIENCING AND THE DEVELOPING BRAIN

Dawson, Hesst, and Frey (1994) write "During the first two years after birth, remarkable and rapid changes take place in the neural physiology, behavior, and social environment of the human infant. However, very little is known about how these three levels of observation relate to and influence one another." This is an important direction for the future, and is already being actively pursued in studies of infants of depressed mothers (Dawson et al., 1994; Field, 1995a, 1995b; Fox, 1991; Tronick & Field, 1986). The work of Perry (1995) has been instrumental in describing how traumatic events in childhood change the biology of the brain. In our consideration of the early determinants of brain development, we are looking at a whole landscape of connections that research and clinical experience already are, and will be, investigating and spelling out in the field of infant mental health. Edelman (1987, 1989, 1992) has provided the theory (neuronal group selection) as well as an empirical base for the detailed exploration of the transmission of values ("limbic system" values in Edelman's sense) from one generation to the next in early development. This introduces the necessity to include the realm of the emotions, of affect, purpose, and meaning in our systems perspective on the infant–caregiver interaction, and if we are thinking of optimizing infant mental health, raises the question: To what extent must the future include the role of intention, purpose, and meaning in organizing healthy coherence in infant–caregiver systems?

Freeman (1995) who describes the brain as a "meaning-making machine," writes that direction, especially direction of intention, is an essential parameter for the integrative self-organizing function of the brain.[2] Awareness of the ubiquity of this principle of direction would

[2] As an illustration, one could propose that we ask the question: Where are we going in infant mental health?—because that is the way our brains work—always requiring us to identify direction in order to organize the flow of the thinking and intention that will govern our next act.

suggest that what we are looking for in evaluating health in early infant development is how direction is being constructed by each infant in the ongoing engagement between that infant and its caregiving environment. Freeman's work on the olfactory bulb of the rabbit illustrated for him that the brain is constantly bringing all memory, all experiencing, all learning and training up to a present Now moment in anticipation of what the next move will be. This is an ongoing integrative process constantly flowing from moment to moment in one's engagement with one's life context. Direction is thus crucial, especially if we remain guided by what the essential evolutionary function of adaptation both means and demands, that is, an ongoing process of fitting together in time, space, movement, and direction between the organism and its ecology, one that achieves the enduring coordination essential for life process to continue over time. To reach a quality of coordination that can be said to be enduring requires a certain capacity for mutual modification by both partners in order to join direction. Thus in our investigation of the quality of process in early infant development, we are seeking not only to understand how direction gets established, which will shape subsequent adaptation, but what it is that permits the flexibility for the adjustments that are required. As we will see, such flexibility points to the centrality of negotiation in resolving adaptive tasks. Negotiation, in turn, often hinges on one's awareness of the state of the other that is essential if a new level of shared meaning, purpose, or direction is to be reached. One might use the word *transcend* here to describe the greater inclusiveness that the shared meeting of two states of consciousness implies. All of this brings us to the way we are to think of the process-organizing consciousness, self-awareness, and awareness of the state of the other.

I would like to give an example, at the very outset of life, of the way the biology and the physiology of the newborn infant's brain connects with the beginnings of its conscious functioning. It is evident that the infant's circadian biorhythmicity (governing the 4–6-h cycling of its states of sleep and wakefulness over the 24-h day) ensures direction in the regular recurrence of exchanges between infant and caregiver. Thus expectancy for recurrence, and sequencing or direction, should be among the first functions of the newborn brain to become operative. For the infant one of the first recurrences would be recurrence in the experiencing of its own state, for example, hunger and satiation, arousal and quiescence, et cetera. The infant's spontaneity of action begins in the service of self-regulation, as recurrence in experiencing of its own state becomes couched within recurrence in the sequence of the caregiving exchanges within which directionality of its own state change occurs. The achievement of shared states of dyadic awareness initially would begin in the resolution of their first adaptive task, namely, that of reaching relative stability in regulation of infant state. Here we would have an example of the joining of direction by two self-organizing systems, mother and infant, an initial and powerful experience of one being together with another.[3]

The capacity for the infant to keep coherent state organization is very important here. Newborns arrive somewhere on the spectrum between the well-organized and the poorly organized. One cannot consolidate a context of stable expectancy unless there is sufficient equilibrium in the system to permit open space within which the infant can select its next initiative

[3] If we can think of Von Bertalanffy's (1952) *organization* as a critical parameter for the living system, coherence of that organization must be essential for health. The above-mentioned work of Main (1985, 1996), with her "coherence variable," connects coherence in maternal organization with coherence in subsequent infant organization—a powerful illustration of what we are paying more and more attention to, namely, intergenerational transmission of the subtleties of functioning in the infant–caregiver system—such as values, meaning, direction. The exploration and elaboration of coherence of organization will be an important matter in the future study of infant mental health. It is a state in both the individual brain and in the system that has already been studied at more elemental levels in infant nuerobiological research with highly promising results. (See the Coherence Index of Prechtl, Weinman, & Akiyama, 1969; Kalverboer, Touwen, & Prechtl, 1973; and Singer, 1994.)

(Sander, 1977). As a step in systems thinking, we begin to see how the organization of the state of infant and caregiver as a system, that is, the whole, shapes the place and role of the part, for example, the emergence of the infant as the volitional agent in its own self-regulatory initiation. We often forget that the background gestalt of the state of the system as a whole is framing the foreground detail of perception, which, in turn, frames initiation of action.

As mentioned above, the work of Perry (1995) elaborates a further dimension of the way that the organization of developing brain morphology is sensitively related to the experiencing of the infant. Perry's (1995) clinical research and practice has focused on traumatized children, examining long-term cognitive, behavioral, emotional, social, and physiological effects of trauma in children, adolescents, and adults. With the sensitively shifting morphology of the brain being a crucial linking step to the longitudinal configuration of developmental course, clearly a future direction for the field of infant mental health will lie in explicating and utilizing positively just what constitutes trauma and its longer-term consequences.

On the other hand if, indeed, the organization of brain morphology in early development is a powerful intervening variable shaping longer-term developmental outcome, future direction should turn to the task of finding new ways of optimizing the positive, constructive dimensions of newborn potential. So often in the past such attempts have amounted to impingement or intrusion upon the infant's self-organizing agency for exploration and discovery. New knowledge is emerging of ways to facilitate more optimal preverbal experiencing—such as suggested by Hart and Ridley (1995) in their study of the effect of the number of words the infant hears per hour in homes of professional versus working class versus welfare parents. Promotion of the health of the infant–caregiver system emphasizes the experience of joining direction in cooperative tasks and play, along with the reinforcing function of sharing the positive emotional experiencing that constructs meaning in the system (Greenspan, 1997; Harding et al. 1997; Trevarthen, 1979).

POTENTIALS AT THE OUTSET OF INFANCY

The sensitive relation between early experiencing and the shaping of infant brain morphology brings us to a third direction for the field of infant mental health, namely, that of determining more definitely the significance of the details of the infant–caregiver interaction in the pre-, peri-, and immediate postnatal period of earliest infancy. The resilience of the living organism to survive and even to thrive within adverse environments has brought serious questions to the fore as to whether any attention need be paid, or any significance need be given, to such details of initial interaction. From the nonlinear dynamical systems perspective and its critical principle of sensitivity to initial conditions, we must ask: Is there an initial "sensitive period" immediately following the birth of the newborn, that shapes potential in the system, for example, related to the foundations for security or insecurity in the new infant's attachment process? Although the proposal of an initial period of special sensitivity has been the subject of much controversy, empirical evidence is accumulating of its actuality and significance in the construction of infant and mother as a system. But that such controversy persists leaves us with a cloud of clumsy confusion at the critical outset of human life. It is clearly imperative that its resolution be a priority for the future in our field of infant mental health.

Since the early 1970s, Klaus, Kennell, and their colleagues have been studying the short span of time before, during, and just following labor and delivery, which has been called a sensitive period. At the mammalian level of evolution this is a time believed to be critical for the establishing of a mutual connection between the new infant and its mother. In more recent work Klaus and Kennell have been joined by Phyllis Klaus, who has developed highly effective methods of working with both medical and psychological concerns of pregnancy, birth, and

the postpartum period (Klaus, Kennell, & Klaus, 1995). They have found, during this span of time, that there is a new openness for the surfacing in parents of old conflicts, memories, and projections. It is a favorable time for psychological exploration of the meaning of the pregnancy for both parents, and an opportunity to differentiate the present self from one's roots and early experiences. But especially there is opportunity to extricate the baby from the potential jungle of projection and attribution. The meaning of the pregnancy can be largely unconscious to the parent, but the infant is picking up tensions, distress, and anxiety, organizing them into expectancies in which later the child sees itself as the cause of the trouble.

In addition to the significance of an early sensitive period, Klaus, Kennell, and Klaus (1993) also have investigated and clarified the positive effectiveness of the presence of a doula—a supportive woman remaining constantly with the mother—during labor, delivery, and immediate postnatal adjustment. Clear documentation is emerging of the important advantages of a doula. Eleven randomized trials have shown significantly fewer C sections, shorter labor, less injected oxytocin (Hodnett, 1997), and in one study where it was explored, decreased maternal depression and increased self-esteem in the mother (Hoffmeyer, Nikodem, Wolman, Chalmers, & Kramer, 1991).

Perhaps the clearest current public demonstration—now approaching worldwide—of the importance of the initial infant–mother interaction, is what is called the Baby Friendly Initiative. This is an in-hospital program, designed by a committee of UNICEF and WHO, to inform and support women in their desire to breastfeed. Since 1991 it has been introduced to hospitals in some 48 countries of the world through UNICEF and WHO; it finally came to the U. S. in 1996. The program includes some 10 points. Among them are the following:

1. The infant remains with the mother after the delivery, in a rooming-in situation. It is not placed in a separate neonatal nursery, which allows the hospital to eliminate the newborn nursery for normal pregnancies and deliveries.
2. Mothers are helped to initiate breastfeeding within the first half-hour after the delivery.
3. Both pacifiers and bottles are eliminated.

In a further extension of the Baby Friendly Initiative, I believe the mother could be offered a daily homemaker for her first week at home after leaving the hospital. This service is part of the recognition of the support the mother needs during the perinatal period if we are to provide optimal conditions within which the new infant–mother–father system can consolidate. It is a period of support that has long been traditional in third world countries. With the presence of the new infant, the 24-hour day has a different structure for the mother, who needs both time, space, and emotional support in which to reorganize herself, her attention, and her new awareness of both herself and her new infant within the family context.

Wider acceptance of the Baby Friendly Initiative means change in thinking and perspective at many levels of both the medical profession and society, especially with the lying-in period now being limited to 24–48 hours or less. A wide area is open for the field of infant mental health to secure new data in investigating and exploring both the short- and longer-term significance of the 10 Baby Friendly Initiative steps; for, example, the introduction of the Baby Friendly Initiative program has seen a drop in abandonment of newborns, from 33/10,000 to 1/10,000 in one Thai hospital (Buranasin, 1991) and from 9/1000 to 2/1000 in a Costa Rica hospital (Mata, Saenz, & Araya, 1998).

If we are to think in terms of nonlinear dynamical systems, the multiple tensions between the many opposing forces that construct them must become harmonized through sufficient coordination between the interacting partners that will endure over time. In the biological world this is just what the process of adaptation or fitting together achieves. Our task for the future

will be in clarifying and making known just how this is best accomplished. In the systems view each detail of process becomes significant in relation to the coherence of the whole. A further example would be the work of Anisfeld, Caspar, Nozyce, and Cunningham (1990), in a study comparing the security–insecurity outcome at 1 year in the Ainsworth Stranger paradigm of infants whose mothers carried their infants with them in a Snuggli, as contrasted with those who placed them in a plastic infant seat. They found that 83% of the infants carried in the Snuggli had secure attachment, whereas only 39% of the infants who were placed in the infant seat were securely attached. A home visit on each sample at 3 months demonstrated that already by this time the mothers of the Snuggli sample perceived, monitored, and responded to their infant's cues more often than did the mothers of the comparison group.

An even more striking indication of the sensitive potential for shaping the attachment process that exists in the early months of postnatal life is that demonstrated by the work of Van den Boom (1994). In this study of 100 mothers between the sixth and ninth postnatal month, three home visits with the parents were carried out. The visits consisted of 2-h teaching sessions dealing with ways to optimize the adaptive process. This group was compared with a control group not receiving the three sessions. At 13 months the sample receiving the teaching sessions showed 68% securely attached in the Ainsworth Stranger Paradigm, whereas the control group that did not have the three teaching sessions showed only 28% secure attachment. One can only begin to glimpse the complexity of factors that must be teased apart, mastered, and implemented if we are to optimize newborn potential as a systems outcome.

A dramatic demonstration of what we have not known about this initial period is the discovery and investigation by Swedish investigators of the crawl of the newborn infant to reach and begin to suckle the mother's breast, entirely on its own (Widstrom, Ransjo-Arvidson, Christensson, Matthiesen, Winberg, & Uvnas-Moberg, 1987). If placed skin to skin on the mother's upper abdomen and lower chest shortly after birth, the newborn lies quietly in an awake alert state for 20 or 30 min, then begins a sequence, uniform across a sample, beginning with lip-smacking, then drooling out of the mouth. As the baby moves forward toward the unwashed breast, its head turns from side to side, and it bounces its nose on its mother's chest as it moves toward the nipple, opening its mouth widely as it gets close to the nipple so that the areola is engulfed, putting the nipple in a position deep in the mouth optimal for the initiation of suckling. If the infant begins suckling within the first half-hour after birth, there is an outflow of oxytocin in the mother's circulation that constricts uterine vessels, controls postpartum bleeding, and reduces pain. Oxytocin secretion, thus stimulated, is within the intercellular matrix of the brain, so that injection of oxytocin alone does not provide the same effect.

Needless to say, the effect on the mother in experiencing the innate competence of her infant is a profound one. It is an experience that conveys the actuality that her infant is the initiating agent in its own self-regulation and self-organization—a cornerstone beginning in the process of differentiation that will be negotiated over the ensuing months.

One mother (Klaus et al., 1995) described the experience of her newborn twin daughters' finding their way to her breasts:

> The first feeling was related to the tremendous feeling of skin against skin. Having the opportunity to place each baby naked on my abdomen was a powerful and reassuring feeling. As my daughter very slowly started to squirm and wiggle and roll up my abdomen towards one of my breasts, I was filled with a feeling of warmth and caring—a feeling of nurturing, a powerful feeling of mothering that I did not feel at birth, although I had thought I would from all of the books that I had read. I knew during this experience that we had really created

these little humans. When she finally reached my nipple after the lengthy trip up my torso and tried to latch on, both my husband and I felt like cheering. During this experience, I also felt wonder—wonder at the ability of our newborn daughters to coordinate their movements and instinctually direct themselves towards my breast. Every other movement we had seen was so uncoordinated that the ability to organize and somehow know where to go was miraculous. On a more emotional note I also felt a sense of reassurance. The first few days after birth were a complicated, confusing, and generally overwhelming time. Seeing each of my daughters complete this journey up my chest to my breast instilled confidence in me. In my mind, my new daughters had arrived in this world with a deep-seated and natural skill for survival and interest in being mothered. This talent my daughters had was terribly reassuring to me as a first-time mom.

From the nonlinear dynamical systems perspective on developmental epigenesis, the events that make up an initial sensitive period become initial conditions that shape the systems trajectory taken by a given mother and her infant in negotiating the sequence of adaptive tasks they face, for example, resolving the paradox of being together with each other while at the same time being distinct from each other in the ensuing critical years of infancy (Sander, 1997). This brings us to our fourth topic.

THE FUTURE AND THE DEVELOPMENTAL PROCESS OVER THE FIRST THREE YEARS OF LIFE

As the field of infant mental health moves toward the future, a central preoccupation will be that of gaining increasingly explicit understanding of the complexities of the developmental process during this initial period, and the discovery of more effective ways to facilitate both infants and caregivers in realizing more optimal outcomes. We will be continuing to unpack the foreground detail relevant to the interactional process going on between them. Given the singularity of each infant and of each caregiver, and within the wide diversity of sociocultural contexts that ensure an even further diversity of infant–caregiver systems, one can ask whether principles of process that are more than new descriptions will ever be defined.

There is a long history of effort to tease apart the complexity of the early developmental process. Each investigator has approached the task from a different perspective that has emerged from a different conceptual framework and has led each to describe their understanding of *process* with a different vocabulary (e.g., Freud, Mahler, Spitz, Erikson, Piaget). The future will bring a translation across these languages that will lead us to a more inclusive restatement of the familiar and traditional, allowing us to arrive at new syntheses. The progression of our understanding of the way infant experiencing influences developing brain organization will be a key factor in such new integrations, as will our present rapid shift to dynamic systems thinking and the way complexity and nonlinearity provide the tools that will help clarify needed principles.

Within the dynamic systems perspective, the ways in which the many opposing forces that generate the multiple tensions of the dynamic system become harmonized will come center stage. One focus of attention will be on how new levels of coordination between infant and caregiver are achieved. Coordination must endure over time if the system is not to break apart. In the biological world this is just what the process of adaptation, or specificity in fitting together brings about. One can think of the adapted state in an infant–caregiver system as a state of relative equilibrium in the balance between dynamic tensions within the system, that sets the stage for new emergent properties to appear. *Equilibrium* also describes a certain harmony that in itself becomes motivational for the work of fitting-together that we call *adaptation*. In each

system a repertoire of adaptive strategies is generated that will be specifically configured for that particular system. It is an operational repertoire of "ways of being with" (Stern, 1985), known as "procedural knowledge" in another lexicon (Grigsby & Hartlaub, 1990) and as "implicit relational knowing" in still another (Lyons-Ruth, 1998). To continue the kind of translation among vocabularies that will be increasingly important as we move to the future, we might add that the construction of our repertoire of adaptive strategies would involve the "three principles of salience" of Lachman and Beebe (1996), which was drawn from the Tronick mutual regulation model (1996); these are regulation, disruption and repair, and heightened affective moments. In each infant–caregiver system, the repertoire of adaptive strategies will be configured, essentially, to ensure the infant's survival within that system. If not, we will have some variant of failure to thrive (Spitz, 1945). One can readily grasp the work involved in reaching a fitting together, as the opposing forces that make the infant–caregiver system a dynamic one become clear. For example, we can ask how infant and mother can resolve the paradox of being together with the other, while at the same time being distinct from that other. The contradiction of such opposites can be left in the system as conflict, or resolution can involve the achieving of a new level of organizational coherence, one that transcends the foreground of conflict. At the human level, such new levels of coordination can depend upon changes in the organization of consciousness of each, for example, changes in the organization of attention—of awareness and of self-awareness.

Our work on the Boston University longitudinal study of early personality development has suggested the idea of an essential link in the way opposites in dynamic polarities become integrated into more inclusive coherence at the human level of the adaptive process (Sander, 1975). I have called this essential link *recognition process*. *Recognition* refers to a moment in time for a specific connection, one in which one comes to know oneself as being known by another, a moment of shared awareness. I call it a *process* because over the first three years of life that our study focused upon, what is being recognized in such a moment of meeting gradually becomes more and more inclusive, as the infant's fitting together with its caregivers advances to levels of greater complexity. The achievement of each adaptive task underlies the acquisition of new capacities, ones that enable the achievement of the next task—an epigenetic sequence. Each is a task for both infant and caregiver because their engagement is within the paradoxical dynamic of ever-opposing forces that construct the dynamic system. It is negotiation between the partners that makes it possible for them to reach coordination, while preserving the distinctness of the agency of each. The unpacking of the art of negotiation will be a key contribution of the future. As specificity is achieved in the process of fitting together, or adaptation at each new level, the inclusiveness implied by recognition increases. Reaching such a moment of meeting involves greater and greater complexity (Sander, 1983). Perception and expectancy move from not only including registration of the state of the other, but after recurrent experiencing of sequence and consequence in the negotiation of disruption and repair, the intention of the other. We come back here to Freeman's point, that direction is essential to the brain's integrative function. Awareness of one's own state and intention, within awareness of the field of intentions of the other, begins the reorganization of consciousness that the experience of recognition sets underway.

The experience of reaching a moment of meeting becomes a moment of positive affective experiencing—a moment of vitalization. Such experiencing thus acquires motivational significance in strengthening subsequent negotiations toward reaching such moments. In another language (the language of biology) one might propose that the experience of vitalization is one reason that adaptation, or fitting together, is deeply sought for among all living systems.

The work of Tronick (1998), centering about the still-face paradigm in the first year of life, provides clarification of the proposal of a recognition process over the first 3 years of life

that has been described in this article. Tronick has proposed the Dyadic Expansion of Consciousness Hypothesis. This states that each individual—infant and mother—is a self-organizing system that creates its own states of consciousness (states of brain organization) that can be expanded into more coherent and complex states in collaboration with another self-organizing system. Tronick (in press) suggests that the connectedness established in dyadic interactions permits the infant to expand his state of consciousness. He elaborates:

> This dyadic state contains more information and is more complex and coherent than either the infant's (or the mother's) endogenous state of consciousness alone. When infant and mother mutually create this dyadic state, i.e. when they become components of a dyadic system, both fulfill the first principle of systems theory, that all living systems seek both greater complexity and coherence. Thus the infant is capable of performing actions in the dyadic system that the infant would not be capable of performing alone, and consequently experiences states of greater coherence and expansion of consciousness. The creation of a dyadic system necessitates that the infant and mother apprehend elements of the other's state of consciousness. If they did not, it would not be possible to create a dyadic state. At the moment the dyadic system is created, both partners experience an expansion of their own state of consciousness—the experience which was originally created from a dyadic collaboration now exists within each individual. There is a powerful subjective effect on the interactants, something akin to a powerful experience of fulfillment.

It is through increasing complexity at the level of conscious organization that the opposing forces implied by a dynamic system can be brought together at a new level of more inclusive coherence, that is, as each partner "apprehends elements of the other's state of consciousness." Again, in this dyadic experience we think of a transcendence of individual limits. As self-organizing systems, each assimilates a bit of the logic by which the governing direction, or intention, of the other is seeking to achieve more inclusive integration. This is the critical significance of negotiation in resolution of paradox. We can think here that Edelman's "limbic system values," or Freeman's "meaning" underlie the brain's integrative function that shapes the necessary mutual modifications that eventuate in the desired state of adaptive coordination. From Freeman's perspective, elements of direction, essential for the brain's integrative function, would be shared. In this sense the state of a more inclusive coherence becomes a motivating goal in the engagement. As we view the wide spectrum of sociological levels, we can translate such a basic principle of life process from the level of family, to that of community, to nation, to globe—all of which brings us to our final section.

When one gets to processes organizing states of consciousness in early development, just how far we still have to go in the field of infant mental health becomes obvious. Many avenues of investigation have not even been mentioned. But, with new technology, the diversity of historical-cultural differences among the many nations of the world now begins to provide a rich resource for the design of comparative studies in future research. It is in our growing access to previously unavailable information about the details of global diversity that an important future direction lies. For a glimpse in this direction let us look at the goals that have been proposed for the World Association for Infant Mental Health.

WHERE ARE WE GOING AT THE ORGANIZATIONAL LEVEL?

If we review the present goals of the World Association for Infant Mental Health and add the perspectives contributed by the multitude of new organizations dedicated to infant mental

health, we can envision the operation of organizing principles similar to the ones we have been discussing at the level of the individual infant, that is, increasing inclusiveness of information integrated at levels of increasingly inclusive coherence.

Let us pause for a moment and see the vision for direction proposed for WAIMH by Osofsky, in her recent I.P.A. newsletter commentary (January 1995). She defines five goals: (a) to promote education, research, and the study of the effects of emotional development during infancy on later normal and psychopathological development; (b) to promote research and study of the mental health of parents, family, and other caregivers of infants; (c) to promote the development of scientifically based programs of care, intervention, and prevention of mental impairment in infancy; (d) to encourage the realization that infancy is a crucial period in the psychosocial development of individuals; (e) to facilitate international cooperation among individuals concerned with promoting optimal development of infants and their families.

In addition, current research goals of WAIMH include (a) concern with nosology and diagnosis in infancy and early childhood; (b) efforts to gain better understanding of the intersubjective world of shared affective and cognitive meaning between infant and caregiver; (c) interest in intergenerational issues and risk, including continuities, discontinuities, and attachment relationships; (d) special concern for infants at high psychological risk to develop effective preventive and intervention strategies for them.

In regard to the global dimensions, to which we are drawing attention here, Osofsky (1995) suggests three further directions for WAIMH: (a) expansion of affiliative activities, that is, bringing together "many groups from far-reaching regions of the world;" (b) growth in communication, that is, providing the tools (for example, a home page on the internet, just now becoming available) with which a cohesive network of connections will be assembled on a global basis; (c) widening collaboration of WAIMH with other national and international groups that share similar interests and goals.[4]

The creativity of the present moment lies in finding common interests among these global organizations that will motivate them to come together in new ways that will heighten their effectiveness. One such possibility would be working together to distill a set of basic principles in living systems that would govern the optimal start for the human infant. What can we all agree upon that would be common among the diversities of people, cultures, histories, languages, ethics, values, and meanings, that make up our global community? By such a shared effort, each organization could define more inclusively direction for itself and avenues for cooperative ventures. Obviously, encountering points of difference and disagreement would identify important issues for future research and investigation, or require the rewording of the set of principles to discover even more basic and inclusive ones.

If one is thinking of new opportunities at the level of global organization through which the state of infant mental health would be facilitated, many new possibilities come to mind. For example, in addition to a home page on the internet, a central data bank could be developed to provide for worldwide access to infancy research findings and designs, epidemiological information, changing national, cultural, or global conditions affecting the beginnings of new life, as well as any relevant outcome data from particular samples. This could include a reference bibliography for worldwide research in infant development, as well as suggestions for sources of funding for new projects of different sorts, or for ideas one might have for future

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[4] Many global organizations have emerged, each with a particular focus of interest in early development. Among them are UNICEF, WHO, WABA, WHA, CIMITAS, CIVITAS, BFI, Zero to Three, Wellstart International, et cetera. This is not to omit familiar organizations whose interests in the developmental process extend well beyond infancy, for example, AACAP, ISCAP, SRCD, et cetera.

projects in different locations and populations that could, in a highly specific way, define and target critical questions.

A second such possibility could be the bringing together of an ongoing think-tank committee of globally involved scientists and clinicians, who, in keeping current with the inflow of new information, could identify exciting research opportunities, imminent dangers, political realities, risks and potentials, with suggestions for whom such information would be most relevant or for new directions for study, intervention, prevention, or optmization. This would be a kind of continuing design center for implementing our question: Where are we going in infant mental health?

A third and related possibility stemming from WAIMH's access to global information and organization could be a public relations–media connection. This would be as the facilitator of a kind of worldwide educational movement, aimed at the task of optimizing infant mental health anywhere on the globe. In conjunction with the think-tank committee resource, the public relations–media resource could organize the most constructive dispersion of the flow of new information, or provide the needed publicity to promote scientific, political, or organizational changes.

SUMMARY

As a way of opening discussion on the question of "Where are we going in the field of infant mental health?"—the orienting theme of this issue—I have suggested that there are a number of frontiers of progress that we are already entering. At a general level it is being increasingly appreciated that we are moving from the perspective of a one-person developmental psychology to that of systems thinking—moving from thinking in terms of structure to the broader view of process. To think in terms of the system of which the individual is but a small part expands the inclusiveness and the complexity, not only of the way we understand what constitutes infant mental health, but what must be involved to bring about changes toward more optimal directions. Our appreciation of what, from the system's point of view, infant mental health really means for the development of a new individual involves the assimilation of a dramatic new grasp of the way the brain works, especially the way infant experiencing and changes in brain morphology are related. What is required to bring about change, from states of lesser to states of greater optimality, will have significance over the entire developmental process, including its relevance to what brings about change in the psychotherapeutic process, a subject of great current interest.

An equally critical shift in thinking for the future of our field is being caused by the pieces that are rapidly being added to our understanding of the genetic determinants of the uniqueness of individual personality. The ways, for example, that temperament, risk-taking, aggressivity–passivity, and many other traits combine in subtle interactions raise new issues for our field. What, then, do we do, once we learn about the genetic underpinnings of our individual differences? Given that the shaping of genetic endowment through one's engagement with one's context is also true, our field faces a new challenge, that is, to find new ways to optimize, rather than to categorize, the new individual.

In contrast with such broad concerns for the future, there are more definable areas in the foreground of infant development that are coming to center stage for investigation and resolution. Among these is the question of the significance of an initial sensitive period for the new infant–caregiver system. Debate will be replaced by increasingly useful resolution of the role of pre-, peri-, and early postnatal experience. What must follow, if there *are* initial conditions shaping basic themes of organization in the new infant–caregiving system, will concern such

functions as state regulation, the background for expectancy, the availability of self-organizing initiative, that is, the unrepresented procedural knowledge constructing basic adaptive strategies.

Closely related is the urgency to apply more widely and effectively the principles of early infant caregiving that investigators such as Stern, Trevarthen, Brazelton, Tronick, Condon, and many others have revealed, in clarifying *process* in early infant–caregiver interaction by unpacking the significance of the fine detail of the foreground of interactional intimacy. I have suggested that among such principles, crucial to the developing organization of self-awareness in the new infant, is the specificity of the experience of personal recognition in the resolution of the sequence of adaptive tasks that mother and infant negotiate over the first 3 years of life. This will include clarification of the way the infant's sense of the validity of self as initiating agent emerges as part of the process generating increasingly inclusive coherence of organization in the infant and caregiver system. The future, in addition, will be clarifying the relevance of each of these facets to the understanding of such things as the matter of attachment in the organizing process, as well as its significance in both the short-term and long-term picture of personality development.

Finally, I have noted the significance of the present awakening of societies to the critical place of infant mental health for the future of social organization. An exciting actuality, at our present moment in time, is the potential this offers for new communication on a global level, new collaborations, implementation of new research, and new preventive measures, as well as the opportunity to learn increasingly effective ways to optimize the broader political potentials inherent in our field of infant mental health.

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