

AWARENESS OF INNER EXPERIENCE: A SYSTEMS PERSPECTIVE ON SELF-REGULATORY PROCESS IN EARLY DEVELOPMENT

LOUIS W. SANDER, M.D.

Professor of Psychiatry, Division of Child Psychiatry, University of Colorado School of Medicine,
Denver, CO 80262

Abstract—This brief synopsis of an organizational perspective on early development represents an integration of three major areas of the author's research: that of a detailed observational study of early mother-infant interaction over the first three years of life; that of a continuous neonatal state and caregiving interactional monitoring method over the first two months of life; and that of a 25- to 30-year follow-up on the same infants observed initially. From these data a ground plan is proposed for our thinking about the individual's life span trajectory as a unique construction within a unique context for that individual's interactional and adaptive self-regulatory strategies. Beginning with a review of biological principles, the paradoxical integration of complexity and unity in living systems is traced from the conceptualization of infant state and observations on its regulation through the role of state in the origins of awareness of inner experience, to the consolidation and validation of the self as agent in self-regulation. Central to integration is the recognition process, stemming from one's awareness that another is aware of what one is aware of within oneself. The constructionist perspective on the critical role of specificity in this organizing process is illustrated by reference to the negotiation between caregiver and infant of seven issues of adaptive coordination over the first three years of life. Finally, five propositions are formulated describing such specificity in this organizing process, as one that underlies integration of levels of the living system relating the biological, the developmental, the shaping of the life span trajectory, and the reconstructive therapeutic process.

Résumé—Cette brève synthèse portant sur la vision organisationnelle du développement précoce représente une intégration de trois domaines majeurs de recherche de l'auteur: celui de l'observation détaillée de l'interaction précoce mère-enfant au cours des trois premières années de vie; celui d'une méthode de surveillance continue de l'état néonatal et de l'interaction de l'enfant avec ceux qui en prennent soin pendant les deux premiers mois de vie; enfin celui d'un suivi annuel de ces enfants initialement observés pendant une période de 25 à 30 ans. A partir de ces données, l'auteur propose un plan de base pour nos concepts concernant la trajectoire de vie d'un individu comme une construction unique à l'intérieur d'un contexte unique face aux stratégies autorégulatrices interactionnelles adaptatives de cet individu. Partant d'une revue des principes biologiques, l'intégration paradoxale de la complexité et de l'unité des systèmes vivants est tracée à partir de la conceptualisation de l'état du premier âge et à partir des observations de sa régulation à travers l'influence de cet état dans les racines du vécu des expériences intérieures jusqu'à la consolidation et la validation du sens du moi comme agent de l'autorégulation. Au centre de cette intégration se trouve le processus de reconnaissance venant de la prise de conscience que l'autre est conscient de ce dont on est conscient à l'intérieur de soi. La vision constructionniste du rôle critique de la spécificité dans ce processus d'aménagement est illustré en faisant référence à la négociation entre sept possibilités de coordinations adaptatives au cours des trois premières années de vie entre le "parent" et l'enfant. Enfin, cinq propositions sont formulées décrivant la spécificité dans ce processus d'aménagement, comme celle qui sous-tend l'intégration des niveaux des systèmes vivants qui se rapportent à l'aspect biologique, au développement, à la formation de la trajectoire de vie et au processus thérapeutique de reconstruction.

TO BE INVITED to participate in this celebration of Brandt Steele's unique career of integration is a great honor. He has stood at the frontiers of psychoanalysis, developmental research and of child psychiatry and has contributed in a major way to each. His

contributions as a clinician, in academic medicine, in research, and in teaching have brought new integrations of these different realms.

In this Festschrift there are a great many of us engaged, each in his or her own way, in responding to and celebrating the person of Brandt Steele, each seeing him, experiencing him, and remembering him in uniquely different ways. Given a "constructionist" viewpoint of perception, there is no other way it could be. We each construct a Brandt Steele. But the person that is Brandt Steele is also engaged in the construction of a viewpoint and a life span that is uniquely his own. Is it possible that these diverse perspectives demand that we focus now on a consideration of integrative processes as being central to our understanding of the human experience?

PERSPECTIVES ON THE INTEGRATIVE PROCESS

The comments we have just made on a remarkable individual introduce the role of the *constructionist* viewpoint in development, of *integration*, and of *individual uniqueness*. What we would like to do in this brief commentary is to offer a few reflections on these three quite disparate realms of thought, by drawing from three areas of research that our group has been involved in over the years.

The first area is that of a detailed observational study of mother-infant interaction over the first three years of life. The second major area of research that occupied our research group for more than 25 years has been the study of the development of 24-hour infant state organization and regulation along the sleep-awake dimension over the first two months of life. Finally, the third, and perhaps most fascinating research task of the last half dozen years, is the study of the 25- 30-year life span of development at outcome on those same individuals we had observed so closely as infants.

From the integration of ideas suggested by this lifetime of research experience, we would like to propose a ground plan for our thinking about the individual's life span trajectory as a unique construction within a unique context. We are presenting these comments as ideas, as reflections, as ways of thinking about life span development—not as findings, or results of direct empirical analysis.

We are beginning to think differently about early development these days than we did a decade ago. We are moving now from ideas of linear causality to systems thinking and the matter of "organization." Alan Sroufe has referred to this as the "organizational perspective" [1, 2]. We have gone from the search for first causes to the search for process. In living systems it is not organization that develops; we begin with organization. Any enduring existence in nature requires the organism to maintain a regulated, ongoing exchange with the surround. Properly timed and appropriately self-regulatory and self-righting functions arise from an endogenous origin of "primary activity." Von Bertalanffy has described two basic properties of living matter: namely, organization and primary activity. This is an endogenous origin of the organism's initiation of action or function that ensures self-activation for the purpose of self-regulation within the specific environment that is that organism's environment of evolutionary adaptation. In short, our search for "process" in the living system leads us to a self-organizing complex [3], wherein the initiative for the self-organizing function inherently arises from within the individual organism and cannot be subsumed by any extrinsic condition or other agency. We will expect then that a search to locate the source for the initiation of the organism's action or function will begin our understanding of the organizing process we know as life process.

In taking this organizational perspective, we begin with a great many already established lawful principles that have advanced the understanding of organization in living systems. Major examples of bodies of lawful principles that govern the ongoing exchange

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between organism and environment are those of regulation, of adaptation (or "fitting together") with a central principle of specificity as the essential ingredient that insures fitting together at every level of adaptation, as emphasized so lucidly by Paul Weiss [4, 5].

The integrative design that guarantees coherent function of the diverse and multi-modal subsystems of the complex living organisms depends on another domain of lawful biological principles. There are a great number of built-in ways that living systems have evolved as the means to accomplish the necessary integration that insures organismic unity. These cannot be detailed at this point [for example, 6]. We will select only one such integrative mechanism in this brief essay, namely, that integration of the multiple physiological, functional, and behavioral subsystems we refer to by the concept of *state*. We can begin with the recurrent and clearly recognizable states of the newborn on the sleep-awake continuum. Here in the healthy newborn there is an integration of a remarkable complexity of physiological subsystems that can be read at once by the observer in a single pattern of behavioral variables. This same phenomenon of the integration of complexity and unity characterizes the emotional states. This is now a subject of great current research interest, at present more often designated by the term "affect."

We cannot escape the fact that, on another level and for the human organism, inner experience in the domain we call "the self" also can be a remarkable integration of components and functions. The sense of self is a multidimensional experience including the sense of the body in space, through the sense of agency, finally including what Winnicott has termed the infant's sense of "own" or of being oneself. In other words, he is referring here to the infant's sense of self-recognition in the beginning awareness of agency, as effectance in self-regulation of his own state begins to be experienced [7]. Erikson long ago suggested, in formulating his final stage of development, that these principles of integrative construction in the organizing process of the living system move us over the life span trajectory toward a final stage of integration. He labeled this simply "integrity" [8].

Constructionist Viewpoint

We can turn briefly now to the different perspectives offered by our three areas of research. Our study of mother-infant interaction over the first three years of life provided the data for our first effort to propose a constructionist view of self-regulation within the organizing process of personality development over the first three years of life. We proposed that this organizing process over the first three years of life really consisted of the negotiation between infant and caregiver of a sequence of adaptations, or fitting together. By this we mean the achievement by mother and infant of those new and specific coordinations that become necessitated by the advancing levels on which the infant can initiate new behaviors and activities. Each level presents the caregiving system with a new requirement for regulation. Each creates an issue as to how, or in what way, for a unique infant within a unique caregiving system, the unique configuration of specific coordinations necessary to achieve an enduring harmony of regulation will be achieved. Such adaptation of one partner to the other is a matter of mutual modification involving both alloplastic and autoplasic modifications. Our initial formulations proposed seven such issues for the construction of adaptive solutions that will be unique for any given mother-infant pair. This epigenetic sequence of adaptive strategies constructed by the participants then provides a framework or logic for describing an organizing process that would lead first to a unique behavioral organization within a particular system and then to character organization in the developing child.

At issue in the negotiation of each of the adaptations in the epigenetic sequence is the extent to which, and the manner in which, the self-activating, self-regulating principles governing the exchange between infant and caregiving environment can generate the con-

ditions necessary for recurrent, coherent inner experiences in the infant [9]. The idea is that such recurrent, coherent and desired inner experiences of the infant, in the negotiation of each level of mutual adaptation between infant and caregiver, establish such inner experience as the inner set-point or goal criterion around which new inputs are matched (in the model of the goal-organized schema) [10]. The modifications of behavior necessary for goal-realization, when successful, generate the situations associated with the infant's reexperience of familiar or desired states. In other words, in the frequently recurrent regulatory situations in the system, the infant's desired states become his goals. The sequence of seven issues we proposed for the first three years of life advanced from adaptations related to initial sleep-awake state regulation, to reciprocal behavioral coordinations, "attunements" as Dan Stern would describe it [11], to "recognition" as the sixth issue late in the second year of life [12]. This is a time when much interaction is being carried out on the level of perceived or inferred intentions for behavior both by infant and caregiver. At issue here again is the specificity which the infant experiences as the infant becomes aware that another is aware of what the infant is aware of within himself. At issue in the mutual modifications of infant and caregiver, that are necessary to achieve the sequence of adaptive coordinations, is the extent to which the system provides support in enabling the infant to use this inner perception. There will be varying degrees to which an infant can rely on this awareness of his own state as a guide to regulate successfully his own behavior within his particular caregiving system. It is a time in which the infant experiences validation or invalidation by the caregiving system of this awareness of his own inner experience as a reliable guide for the construction of new adaptive schemes in the exchanges with the caregivers.

Integration

We turn now in this brief commentary to the second area of our research: namely, that concerning the initial regulation of infant states over the first two months of life. From this extensive work, that studied infant and caregiver together continuously around the clock as a regulatory system, we were introduced to a whole domain of organizational principles related to biorhythmicity, entrainment, phase synchrony, and especially temporal "coherence" among physiological subsystems. Here again is another domain of lawful principles of integration.

Three central factors in the organization of the infant-caregiver system have stood out from our experience in investigating the basic role of biorhythmicity in the organization of living systems. One condition which the 24-hour (circadian) nature of biorhythmicity sets up for the infant-caregiving system is a daily recurrent situation beginning, of course, with the daily recurrence of four to six awakenings of the infant. This provides an essential condition of repetition over and over of infant state sequences and caregiving events upon which habituation and learning can be based. A second essential organizational framework that the phenomenon of biorhythmicity sets up for both infant and caregiver is a time structure of this 24-hour day that they both come to share. It is at the point when a first level of adaptation is achieved, involving stable regulation of infant states on the sleep-awake continuum, that the shared time structure can become the basis for expectancies that are common to both infant and caregiver. This might also be identified as a first level on which the intersubjective world so beautifully described by Stern [11] might be said to begin. But it would be part of a stably regulated, competent system in a state of adapted coordination and not the property of any single or nonadapted component within that system. Such shared time structure provides for each partner a common basis for the meaning of recurrent behaviors in the day's sequence of events. For example, an important measure for a mother's reading of the meaning of her infant's crying depends on the

time it occurs in the familiar event structure of the day. A third element that the early temporal structure provides in a stably regulated infant-caregiver system is the experience of the "meeting" of infant and caregiver in states of matched readiness or expectancy. This is not a matter of one eliciting a response from the other, but a temporally synchronized meeting in states of matched expectancy and readiness of one for the other. For example, the breast-feeding mother comes to expect when her infant will soon be waking from his nap because her breasts are becoming filled. The adapted harmony or equilibrium of regulation that sets the temporal synchrony for such moments provides a common experience for both infant and caregiver; the responsibility for regulation does not rest on a necessary prior disharmony or distress within one or the other of interacting partners, but is now a property of an adapted system. This can be viewed as a matter of profound significance in biasing infant expectation for what is "given" in relation to what is to be "gotten," namely, the anlage for the emergence of trust.

Individual Uniqueness

The third area of our research we mentioned at the outset concerns the study of the life span of the 30 infants we began with in 1954 that led to the formulation of our attempt at a constructionist view of development which we have alluded to above, i.e., the conceptualization of a sequence of issues in the interactional adaptation between infant and caregiver. We will underline only one outstanding lesson here that we have learned from this follow-up research. We have been unable to escape the actuality of uniqueness in every aspect of each subject's data. The closer one looks, the greater individuality is apparent.

The significance of uniqueness is not how one can judge that uniqueness from normative standards but what organizing processes and relationships account for it and depend on it, and what the significance is of recognizing the specific ways an individual is unique. We ask in what degree is recognition of that uniqueness a necessary element in shaping the individual's construction of his life span trajectory? We can ask, after decades of studying the normative, is it possible that attention to uniqueness will now have a new significance in developmental research instead of our merely continuing to limit ourselves to the repair of tragedies and deficits in this early developmental process? What aspects of that uniqueness will be critical to recognize? It will certainly be central if we are to address the optimizing of early developmental process for any child. A major effort in the "self-psychology" approach to the therapeutic process is that of enabling the individual not only to discover his own inner experience but to recognize, validate, and esteem its uniqueness. In what we have touched upon in this brief essay, we can see a linkage between biological origins, developmental process, life span trajectory, and therapeutic process. The integration of processes common to each of these domains we propose centers upon the occurrence or experience of specificity in the recognition process. This integration we refer to now as recognition process theory.

The hypothesis that we are looking at in the longitudinal study follow-up is that the configuration of adaptive strategies that the child by 2 years of age has constructed in fitting together with his own particular unique caregiving context provides a configuration that is recognizable in the way that individual at outcome is constructing his ecologic niche and his world of self-regulation. This is a recognizability of configuration, not a correlation.

What if instead of beginning our conceptualization of psychological development with an undifferentiated newborn, we began with the idea that the organizing process in development begins with specificity in the exchanges between infant and caregiver that are at the highest and most differentiated level of organization of which each is capable. We are referring to the organization of experiences of awareness upon which the organization of

consciousness would rest. The idea is that "experiencing" is possible from the outset, at least the outset of postnatal life. This experiencing we propose is especially in terms of the infant's own inner state, which, as we have noted in speaking of the biorhythmic structure of organization in the infant-caregiver system, is regularly recurrent. Can we consider that it might be in the way, from the outset, that the highest levels of organization possible can come into a specificity of exchange that may play a critical role in biasing the sequential logic organizing the longer term trajectory of developmental construction? Remember, we are here beginning with prerepresentational experience in the earliest months of life, where infant's action directly can change his own state, not some representation or symbol of it. If inner awareness is the critical experience in the infant's self-regulation of his own states, construction of adaptive strategies and behavioral organization within the infant's own particular system proceeds as this awareness of his own state becomes the inner criterion or set-point of goal-organizing schemata. This would be especially so when such strategies and behavioral organizations come to be based on the infant's experiences of competence as agent in successfully regulating his own desired states. This is achieved in the regularly recurrent interactive situation of the adapted infant-caregiver system as the infant's own desired states become his goals.

SUMMARY

These ideas can be summarized in a framework of five propositions [13]. At the moment they can be thought of as a kind of logic of construction by which the individual shapes his longer-term developmental trajectory. Very briefly, the five steps run somewhat as follows:

1. The infant's initial inner experience consolidates around the experience of his own recurrent states. The initial ego is not a body ego but a state ego.
2. The infant's own states, where coherent, recurrent, desired, or essential to key regulatory coordinations, become the primary target or goals for behavior. By states we must include emotional states that have their own configurational indicators from birth onward, i.e., the affects.
3. Infant competence in initiating and organizing self-regulatory behaviors to achieve desired states as goals represents a systems competence, i.e., dependent on facilitation of goal realization, as well as providing conditions for the infant's initiation of this goal-organized behavior. Such systems competence insures a sense of agency in the infant. The emergence of infant-as-agent must be granted by the system because it means a reorganization of the system to admit the newcomer.
4. Each infant-caregiver system constructs its own unique configuration of regulatory constraint on the infant's access to awareness of his own states, his own inner experience and his access to options to initiate the organization of schemes of self-regulatory behavior on the basis of this criterion of inner experience. These configurations then become a repertoire of enduring coordinations or a repertoire of adaptive strategies between the interacting participants of each infant-caregiving system. These strategies set the conditions in the system by which the infant can construct situations in which he can reexperience a knowing of, or recognition of himself. Construction of experiences, in which one recognizes oneself in terms of reexperiencing familiar states, is the vehicle by which a sense of continuity of self is conveyed. The experience of self-recognition constitutes a parameter which biases the infant's later construction of his ecologic niche in which the same repertoire of adaptive strategies, which now can be

called self-regulatory, promise the experience of a familiar continuity of predictable self-recognition.

5. A continuing differentiation of the individual's competence as agent to reconstruct the array of familiar states under widening and changing contextual circumstances is an ongoing life span process. It remains biased by the organizing logic of the early experience that first confirmed continuity by recreation of familiar inner experience consequent on individual uniqueness, a repeated process, becoming ultimately the construction of that individual's life span trajectory. Differentiation and continuity proceed in a close and paradoxical connection with competence of regulatory coordination in the system. The better regulation is achieved in the system, the better increasing differentiation proceeds and, paradoxically, the experience of continuity.

The reader who is familiar with Brandt Steele's seminal and richly documented paper, "The Effects of Abuse and Neglect on Psychological Development," which appeared in *Frontiers of Infant Psychiatry*, Volume 1, 1983 [14], will have graphically illustrated there examples of the profound effects of derailment of the organizing processes in early development that we have tried to bring together in this brief synopsis. Especially there in his discussion of development of the self is the specific reference to the processes of validation of the infant's inner experience of his own states leading to "a certain coherence of the primordial self." Without this the self is experienced as "irrelevant if not actually erroneous." It is "henceforth in some degree disregarded." Such an infant "remains persistently oriented toward the outside world for cues and guidance, disregarding to a greater or lesser extent his own internal sensations, needs, and wishes." In pathogenesis, as well as in normal development, there is a critical role for what is in the awareness of both infant and caregiver and in the way it enters and shapes their encounter. The organization of consciousness in early experience becomes a central clue to the organization of the developing personality and its construction of the trajectory of the life span over its longer term.

In conclusion, then, an interest in the course or trajectory of the quality of inner experience, or experience of one's own state, is exactly what you might expect of the interest of a psychoanalyst who turns to early developmental research to understand the person of the patient.

It is anchoring to realize that this need to gain perspective on our own experience of "being" over time in order to understand the being of another has been felt by mankind almost back to its dim origins in history. In ancient Sanskrit, nearly 4,000 years ago, noun usage was derived from reference to appropriate verbs. There was an expression for person—the word "perusha"—from which our noun "person" later emerged. One must think for a moment to imagine what the verb or action construction might be by which one might designate person and be generally understood in the community. In those times perusha meant "consciousness constructing for itself a form." It is hard today to think of a more profound designation for the organizing process constructing the trajectory of a person's life span.

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