

THE
INTERPERSONAL
WORLD
OF THE INFANT

*A View from Psychoanalysis
and Developmental
Psychology*

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Chapter 3

The Sense of an Emergent Self

THE AGE of two months is almost as clear a boundary as birth itself. At about eight weeks, infants undergo a qualitative change: they begin to make direct eye-to-eye contact. Shortly thereafter they begin to smile more frequently, but also responsively and infectiously. They begin to coo. In fact, much more goes on during this developmental shift than what is reflected by increased overt social behaviors. Most learning is faster and more inclusive. Strategies for paying attention to the world shift in terms of altered visual scanning patterns. Motor patterns mature. Sensorimotor intelligence reaches a higher level, as Piaget has described. Electroencephalograms reveal major changes. Diurnal hormonal milieu stabilizes, along with sleep and activity cycles. Almost everything changes. And all observers of infants, including parents, agree on this (Piaget 1952; Sander 1962; Spitz 1965; Emde et al. 1976; Brazelton et al. 1979; Haith 1980; Greenspan and Lourie 1981; Bronson 1982).

Until this developmental shift occurs, the infant is generally thought to occupy some kind of presocial, precognitive, preorganized life phase that stretches from birth to two months. The central questions of this chapter are, how might the infant experience the social world during this initial period? And what might be the

infant's sense of self during this time? I conclude that during the first two months the infant is actively forming a sense of an emergent self. It is a sense of organization in the process of formation, and it is a sense of self that will remain active for the rest of life. An overarching sense of self is not yet achieved in this period, but it is coming into being. To understand how this conclusion was reached, it is necessary to understand the likely nature of infant experience at this age.

In the last fifteen years a revolution has occurred in observing and thereby evaluating infants. One result of this revolution is that the infant's subjective social life during the first two months has had to be reconsidered.

Observing the Young Infant: A Revolution in Infancy Research

The following description of the revolution in infancy research is intended to serve several purposes: to show some of the infant capacities that bear on forming a sense of self, capacities that no one imagined to be present so early one or two decades ago; to provide a common vocabulary and set of concepts for what is to follow; and, perhaps most important, to expand the frame of reference about infants that is commonly prevalent among clinicians and others who have not been able to keep up with the rapidly growing literature on infancy. Knowledge of the newly discovered infant capabilities will in itself do the expanding.

People have always had questions they would like to have asked of infants. What do infants see, smell, feel, think, want? Good questions abounded, but answers were scarce. How could an infant answer? The revolution in research consisted of turning the situation on its head, by asking not, what is a good question to pose to an infant? but, what might an infant be able to do (like sucking) that would serve as an answer? With this simple turn-around, the search for infant abilities that could be made into answers (response measures) began, and the revolution was set in motion.

One other change in view was required. This was the realization that newborns are not always in a state of sleep, hunger, eating,

fussing, crying, or full activity. If that were the case, all potential behavioral "answers" would always be either already in action or precluded by another activity or state. But it is not the case. Starting from birth, infants regularly occupy a state called alert inactivity, when they are physically quiet and alert and apparently are taking in external events (Wolff 1966). Furthermore, alert inactivity can last several minutes, sometimes longer, and recurs regularly and frequently during wakefulness. Alert inactivity provides the needed time "window" in which questions can be put to newborns and answers can be discerned from their ongoing activity.

The issue at stake is, how can we know what infant's "know"? Good infant "answers" have to be readily observable behaviors that are frequently performed, that are under voluntary muscular control, and that can be solicited during alert inactivity. Three such behavioral answers immediately qualify, beginning at birth: head-turning, sucking, and looking.

The newborn does not have good control of his or her head and cannot hold it aloft in the upright position. But when lying on their backs so that their heads are supported, newborns do have adequate control to turn the head to the left or right. Head-turning became the answer to the following question: can infants tell the smell of their own mothers' milk? MacFarlane (1975) placed three-day-old infants on their backs and then placed breast pads taken from their nursing mothers on one side of their heads. On the other side, he placed breast pads taken from other nursing women. The newborns reliably turned their heads toward their own mothers' pads, regardless of which side the pads were placed on. The head-turning answered MacFarlane's question in the affirmative: infants are able to discriminate the smell of their own mothers' milk.

Newborns are good suckers. Life depends on sucking, a behavior that is controlled by voluntary muscles. When not nursing (nutritive sucking), infants engage in a great deal of non-nutritive sucking on anything they can get hold of, including their own tongues. Non-nutritive sucking occurs during the newborn's periods of alert inactivity, making it a potentially good "answer." Infants can rapidly be trained to suck to get something to happen. It is done by placing a pacifier with an electronically bugged nipple—that is, one with a pressure transducer inside it—in the infant's mouth. The transducer is hooked up to the starter mechanism of a tape recorder or slide

carousel, so that when the infant sucks at certain specified rates the recorder goes on or the carousel turns over a new slide. In that way infants control what they hear or see by maintaining some rate of sucking (Siqueland and DeLucia 1969). Sucking was used to determine whether infants are especially interested in the human voice, in preference to other sounds of the same pitch and loudness. The infants' sucking rates answered the question affirmatively (Friedlander 1970).

Newborns arrive with a visual motor system that is mature in many respects. They see reasonably well at the right focal distance, and the reflexes controlling the eye movements responsible for object fixation and visual pursuit are intact at birth. Infant looking patterns are thus a third potential "answer." Fantz (1963), in a series of pioneering studies, used infant visual preferences to answer the question, do infants prefer looking at faces rather than at various other visual patterns? They do indeed, though the reasons are complicated. (Note that all three questions asked in these studies concern interpersonal or social issues and attest to the early responsiveness of infants to their social world.)

To yoke these "answers"¹ to more interesting questions, several paradigms have been developed and elaborated. To learn whether an infant prefers one thing over another, one need only put the two stimuli in competition in a "paired comparison preference paradigm" and see which stimulus wins out for attention. For instance, if an infant is shown a symmetrical pattern in which the left side is the mirror image of the right side, and next to it is shown the same pattern lying on its side, so the top half is the mirror image of the bottom half, the infant will look longer at the left-right mirror images than at the top-bottom mirror images (see Sherrod 1981). Conclusion: infants prefer symmetry in the vertical plane, characteristic of human faces, to symmetry in the horizontal plane. (Note that parents automatically tend to align their faces to the infant's in the vertical plane.)

But suppose there is no preference for one thing over another. Can we still find out if the infant can tell them apart? To determine if infants can discriminate one thing from another, some form of the "habituation/dishabituation" paradigm is used. This method is based

1. Heart rate change and evoked potentials as psychological responses to external events also can be used as answers, either alone or to validate the behavioral answers.

on the notion that if the same thing is presented to infants repeatedly, they will respond to it progressively less. Presumably, this reaction of habituation is due to the fact that the original stimulus becomes less and less effective as it loses its novelty. In effect, the infant gets bored with it (Sokolov 1960; Berlyne 1966). If one wishes to know, for example, if infants can discriminate a smiling face from a surprise face, one presents the smiling face six or so times as the infants look at it progressively less. The surprise face of the same person is then substituted for the next expected presentation of the smiling face. If the infants notice the substitution they will dishabituate, that is, look at it a lot, as they did the smiling face at its first presentation. If they cannot tell the surprise face from the smiling one, then they will continue to habituate, that is, look at it as little as they had come to look at the smiling face after seeing it repeatedly.

These procedures tell only if infants can make a discrimination or not. They do not tell whether they have formed any concept or representation of the properties that generally make up a smile. To know that, one must take an additional step. It must be shown, for example, that an infant will discriminate a smile regardless of whose face it is on. One then can say that the infant has an abstract representation of the invariant (unchanging) properties that constitute smiles regardless of variant (changing) properties such as whose face is wearing the smile.

Using these kinds of experimental paradigms and these methods of eliciting "answers" from infants, an impressive body of information has been gathered. The examples given not only explain how one inquires about infants and hint at the capacities that infants are being found to have; they also help in laying out the information from which we can draw some general principles about infant perception, cognition, and affect that will be needed for the arguments in this chapter and elsewhere (see Kessen et al. 1970; Cohen and Salapatek 1975; Kagan et al. 1978; Lamb and Sherrod 1981; Lipsitt 1983; Field and Fox, in press). These, in brief, are:

1. Infants seek sensory stimulation. Furthermore, they do it with the preemptory quality that is prerequisite to hypothesizing drives and motivational systems.
2. They have distinct biases or preferences with regard to the sensations they seek and the perceptions they form. These are innate.

3. From birth on, there appears to be a central tendency to form and test hypotheses about what is occurring in the world (Bruner 1977). Infants are also constantly "evaluating," in the sense of asking, is this different from or the same as that? How discrepant is what I have just encountered from what I have previously encountered (Kagan et al. 1978)? It is clear that this central tendency of mind, with constant application, will rapidly categorize the social world into conforming and contrasting patterns, events, sets, and experiences. The infant will readily discover which features of an experience are invariant and which are variant—that is, which features "belong" to the experience (J. Gibson 1950, 1979; E. Gibson 1969). The infant will apply these same processes to whatever sensations and perceptions are available, from the simplest to the ultimately most complex—that is, thoughts about thoughts.
4. Affective and cognitive processes cannot be readily separated. In a simple learning task, activation builds up and falls off. Learning itself is motivated and affect-laden. Similarly, in an intense affective moment, perception and cognition go on. And, finally, affective experiences (for example, the many different occasions of surprise) have their own invariant and variant features. Sorting these is a cognitive task concerning affective experience.

This view of the young infant, made possible by the revolution in research, is mainly cognitive and determined in large part by the nature of experimental observations. But what about the young infant as viewed by clinicians or parents, and what about the more affective infant with motivations and appetites that force the infant out of the state of alert inactivity? It is here that the divergence between the observed and clinical infant may begin.

The Clinical and Parental View of the Young Infant

The vast majority of the mother's time during the infant's first two months is spent in regulating and stabilizing sleep-wake, day-night, and hunger-satiation cycles. Sander (1962, 1964) has called the primary task of this early period that of physiological regulation, and Greenspan (1981) that of homeostasis.

When the baby first comes home from the hospital, the new parents live from minute to minute, attempting to regulate the

newborn. After a few days they may be able to see twenty minutes into the future. By the end of a few weeks, they have the luxury of a future that is predictable for stretches of time as long as an hour or two. And after four to six weeks, regular time clumps of three to four hours are possible. The tasks of eating, getting to sleep, and general homeostasis are generally accompanied by social behaviors by the parents: rocking, touching, soothing, talking, singing, and making noises and faces. These occur in response to infant behaviors that are also mainly social, such as crying, fretting, smiling, and gazing. A great deal of social interaction goes on in the service of physiological regulation. Sometimes parents fail to appreciate that social interactions are happening when they so realistically have their eye on the goal of the activity, such as soothing the baby; the ends seem all important, and the means to those ends go unnoticed as moments of interpersonal relatedness. At other times, parents do focus on the social interaction and act, from the beginning, as though the infant had a sense of self. Parents immediately attribute their infants with intentions ("Oh, you want to see that"), motives ("You're doing that so Mommy will hurry up with the bottle"), and authorship of action ("You threw that one away on purpose, huh?"). It is almost impossible to conduct social interaction with infants without attributing these human qualities to them. These qualities make human behavior understandable, and parents invariably treat their infants as understandable beings, that is, as the people they are about to become, by working in the infant's zone of proximal development.²

Parents thus view young infants on the one hand as physiological systems in need of regulation and, on the other hand, as fairly developed people with subjective experiences, social sensibilities, and a sense of self that is growing, if not already in place.

Classical psychoanalysis has focused almost exclusively on physiological regulation during this early period, while seeing right past the fact that much of this regulation was actually conducted via the mutual exchange of social behaviors. This approach has resulted in

2. While parents are consummate experts at this alignment with the future states of being of their infants, there is a related phenomenon in therapy. Friedman (1982) points out that "it is not necessary for the analyst to know the exact nature of the development he is encouraging. It is sufficient that he treats the patient as though he were roughly the person he is about to become. The patient will explore being treated that way, and fill in the personal details" (p. 12).

the picture of a fairly asocial infant, but it has also provided a rich description of the infant's inner life as it is affected by changes in physiological state. For instance, Freud (1920) saw infants shielded from relatedness by the "stimulus barrier" that protected them from having to register and deal with external stimulation, including other people. Mahler, Pine, and Bergman (1975) have viewed infants as occupying a state of "normal autism," essentially unrelated to others. In both of these views infants are related to others only indirectly, to the extent that the others influence their internal states of hunger, fatigue, and so on. In these views, infants remain in a prolonged state of undifferentiation, in which no social world exists, subjectively, to help them discover a sense of self or of other. On the other hand, the fluctuating affects and physiological tensions that befall infants are seen as the wellspring of experiences that will ultimately define a sense of self. These experiences occupy center stage for the first two months.

The British object relations "school" and H. S. Sullivan, an American parallel, were unique among clinical theorists in believing that human social relatedness is present from birth, that it exists for its own sake, is of a definable nature, and does not lean upon physiological need states (Balint 1937; Klein 1952; Sullivan 1953; Fairbairn 1954; Guntrip 1971). Currently, the attachment theorists have further elaborated this view with objective data (Bowlby 1969; Ainsworth 1979). These views consider the infant's direct social experience, which parents have always intuited to be part of the infant's subjective life, to be the central focus of concern.

All these clinical theories have a common assertion: that infants have a very active subjective life, filled with changing passions and confusions, and that they experience a state of undifferentiation by struggling with blurred social events that presumably are seen as unconnected and unintegrated. These clinical views have identified some of the salient experiences of internal state fluctuations and social relatedness that could contribute to a sense of self, but they have not been in a position to discover the mental capacities that might lead the infant to use these experiences to differentiate a sense of self or of other. That is where the experimental work of developmentalists makes its contribution. It permits us to look at how the infant might experience the worlds of affect and changes in

tension state as well as the perceptions of the external world that accompany affect and tension changes. After all, it is the integration of all of these that will constitute the infant's social experience.

*The Nature of the Emergent Sense of Self:
the Experience of Process and Product*

We can now return to the central question: what kind of sense of self is possible during this initial period? The notion that it exists at all at these very early ages is generally dismissed or not even broached, because the idea of a sense of self is usually reserved for some overarching and integrating schema, concept, or perspective about the self. And clearly, during this early period infants are not capable of such an overview. They have separate, unrelated experiences that have yet to be integrated into one embracing perspective.

The ways in which the relations between disparate experiences can come into being have been the basic subject matter of much of the works of Piaget, the Gibsons, and associational learning theorists. Clinical theorists have lumped all these processes together and described them metaphorically as the forming of "islands of consistency" (Escalona 1953). They describe the leaps that make up this development of organization in terms of the cognitions at each progressive step or level. They thus tend to interpret the product of those integrating leaps as the sense of self. But what about the process itself—the very experience of making the leaps and creating relations between previously unrelated events or forming partial organizations or consolidating sensorimotor schemas. Can the infant experience not only the sense of an organization already formed and grasped, but the coming-into-being of organization? I am suggesting that the infant can experience the process of emerging organization as well as the result, and it is this experience of emerging organization that I call the emergent sense of self. It is the experience of a process as well as a product.

The emergence of organization is no more than a form of learning. And learning experiences are powerful events in an infant's life. As

we have already noted, infants are predesigned to seek out and engage in learning opportunities. All observers of learning, in any form, have been impressed with how strongly motivated (that is, positively reinforcing) is the creation of new mental organizations. It has been proposed that the early learning described by Piaget that results in the consolidation of sensorimotor schemes such as thumb-to-mouth is intrinsically motivated (Sameroff 1984). The experience of forming organization involves both the motivated process and the reinforcing product; I will focus here more on the process.³

But first, can infants also experience non-organization? No! The "state" of undifferentiation is an excellent example of non-organization. Only an observer who has enough perspective to know the future course of things can even imagine an undifferentiated state. Infants cannot know what they do not know, nor that they do not know. The traditional notions of clinical theorists have taken the observer's knowledge of infants—that is, relative undifferentiation compared with the differentiated view of older children—reified it, and given it back, or attributed it, to infants as their own dominant subjective sense of things. If, on the other hand, one does not reify undifferentiation as an attribute of the infant's subjective experience, the picture looks quite different. Many separate experiences exist, with what for the infant may be exquisite clarity and vividness. The lack of relatedness between these experiences is not noticed.

When the diverse experiences are in some way yoked (associated, assimilated, or connected in some other way), the infant experiences the emergence of organization. In order for the infant to have any formed sense of self, there must ultimately be some organization that is sensed as a reference point. The first such organization concerns the body: its coherence, its actions, its inner feeling states, and the memory of all these. That is the experiential organization with which the sense of a core self is concerned. Immediately prior to that, however, the reference organization for a sense of self is still forming; in other words, it is emergent. The sense of an emergent self thus concerns the process and product of forming organization. It concerns the learning about the relations between the infant's sensory experiences. But that is essentially what all learning is about.

3. The self-organizing tendencies of many systems have been noted, and Stechler and Kaplan (1980) have applied these notions to the self in development. The concern here is, however, with the subjective experience of forming organization.

Learning is certainly not designed for the exclusive purpose of forming a sense of self, but a sense of self will be one of the many vital byproducts of the general learning capacity.

The sense of an emergent self thus includes two components, the products of forming relations between isolated experiences and the process. The products will be discussed in greater detail in the next chapter, on the sense of a core self, which describes which products come together to form the first encompassing perspective of the self. In this chapter I will focus more sharply on the process, or the experience of organization-coming-into-being. To do so, I will examine the various processes available to the young infant for creating relational organization and the kinds of subjective experiences that might evolve from engaging in these processes.

Processes Involved in Forming the Sense of an Emergent Self and Other

AMODAL PERCEPTION

In the late 1970s, the findings of several experiments raised profound doubts about how infants learn about the world, that is, how they connect experiences. What was at stake was the long-standing philosophical and psychological problem of perceptual unity—how we come to know that something seen, heard, and touched may in fact be the same thing. How do we coordinate information that comes from several different perceptual modalities but emanates from a single external source? These experiments drew widespread attention to the infant's capacity to transfer perceptual experience from one sensory modality to another and did so in an experimental format open to replication.

Meltzoff and Borton's experiment (1979) lays out the problem and issue clearly. They blindfolded three-week-old infants and gave them one of two different pacifiers to suck on. One pacifier had a spherical-shaped nipple and the other was a nipple with nubs protruding from various points around its surface. After the baby had had some experience feeling (touching) the nipple with only the mouth, the

nipple was removed and placed side by side with the other kind of nipple. The blindfold was taken off. After a quick visual comparison, infants looked more at the nipple they had just sucked.

These findings seemed to run counter to current accounts of infant learning and world knowledge. On theoretical grounds, infants should not have been able to do this task. A Piagetian account would have required that they first form a schema of what the nipple felt like (a haptic schema) and a schema of what the nipple looked like (a visual schema); then these two schemas would have to have some traffic or interaction (reciprocal assimilation), so that a coordinated visual-haptic schema would result (Piaget 1952). Only then could the infants accomplish the task. Clearly, the infants did not in fact have to go through these steps of construction. They immediately "knew" that the one they now saw was the one they had just felt. Similarly, a strict learning theory or associationist account of these findings would be at a total loss to explain them, since the infants had had no prior experience to form the required associations between what was felt and what was seen. (For fuller accounts of the problem in its theoretical context, see Bower 1972, 1974, 1976; Moore and Meltzoff 1978; Moes 1980; Spelke 1980; Meltzoff and Moore 1983.) While this haptic-visual transfer of information appears to improve and get faster as infants get older (Rose et al. 1972), it is clear that the capacity is present in the first weeks of life. Infants are pre-designed to be able to perform a cross-modal transfer of information that permits them to recognize a correspondence across touch and vision. In this case the yoking of the tactile and visual experiences is brought about by way of the innate design of the perceptual system not by way of repeated world experience. No learning is needed initially, and subsequent learning about relations across modalities can be built upon this innate base.

The correspondence just described occurred between touch and vision, and it concerned shape. What about other modalities, and what about other qualities of perception, such as intensity and time? Are infants equally gifted in recognizing these cross-modal equivalences? Using heart rate as an outcome measure in a habituation paradigm, Lewkowicz and Turkewitz (1980) "asked" three-week-old infants which levels of light intensity (luminescence of white light) corresponded best with certain levels of sound intensity

(decibels of white noise). The infant was habituated to one level of sound, and attempts at dishabituation were then made with various levels of light, and vice versa. In essence, the results revealed that these young infants did find that certain absolute levels of sound intensity corresponded with specific absolute levels of light intensity. Furthermore, the matches of intensity level across modes that the three-week-olds found to be most correspondent were the same matches that adults chose. Thus, the ability to perform audio-visual cross-modal matching of the absolute level of intensity appears to be well within infants' capacity by three weeks of age.

How about time? At present, few experiments bear directly on the question of whether an infant can translate temporal information across perceptual modalities (see Allen et al. 1977; Demany et al. 1977; Humphrey et al. 1979; Wagner and Sakowitz 1983; Lewkowicz, in press; and Morrongiello 1984). Using heart rate and behavior as the respondent measures, these investigators show that infants recognize that an auditory temporal pattern is correspondent with a similar visually presented temporal pattern. It is almost certain that in the near future there will be many more such experiments demonstrating infants' capacities to transfer, intermodally, the properties of duration, beat, and rhythm, as specifically defined. These temporal properties are readily perceived in all modalities and are excellent candidates as properties of experience that can be transferred cross-modally, because it is becoming clearer that the infant from early in life is exquisitely sensible of and sensitive to the temporal features of the environment (Stern and Gibbon 1978; DeCasper 1980; Miller and Byrne 1984).

Of all these transfers of properties between modes, the hardest to imagine is how an infant might be able to transfer information about shape between the visual and auditory modes. Shape is not usually conceived of as an acoustic event; the shape transfer is easier to imagine across the tactile and visual modes. But speech itself, in a natural situation, is a visual as well as an acoustic configuration, because the lips move. Intelligibility goes up considerably when the lips are in view. By six weeks, babies tend to look more closely at faces that speak (Haith 1980). Moreover, when the actual sound produced is in conflict with the lip movements seen, the visual information unexpectedly predominates over the auditory. In other

words, we hear what we see, not what is said (McGurk and MacDonald 1976).⁴

* The question then seems irresistible: can infants recognize the correspondence between auditorily and visually presented speech sounds? That is, can they detect the correspondence between the configuration of a sound as heard and the configuration of the articulatory movements of the mouth that produce the sound as seen? Two separate laboratories working simultaneously on this problem came up with a positive answer (MacKain et al. 1981, 1983; Kuhl and Meltzoff 1982). The two experiments used a similar paradigm but different stimuli. They both presented the infant with two faces seen simultaneously. One face articulated one sound and the second face articulated a different sound, but only one of the two sounds was actually produced for the infant to hear. The question was whether the infant looked longer at the "right" face. MacKain et al. used a variety of disyllables as stimuli (mama, lulu, baby, zuzu), while Kuhl and Meltzoff used single vowels "ah" and "ee." Both experiments found that the infants did recognize the audio-visual correspondences.⁵ The concordant results of the two experiments greatly strengthen the finding.

* How about the sensation of one's own movement or position, that is, the modality of proprioception? In 1977, it was shown that three-week-old infants would imitate an adult model in sticking out their tongues and opening their mouths (Meltzoff and Moore 1977). While the ability to perform these early imitations had been observed previously and commented upon (Maratos 1973; Uzgiris 1974; Trevarthen 1977), the strongest possible inferences had not been made—namely, that there was an innate correspondence between what infants saw and what they did. Subsequent experiments showed that even the protrusion of a pencil or the like could also produce infant tongue protrusion.

Later, the issue was removed to the sphere of affect expression. Field et al. (1982) reported that newborn infants, age two days, would reliably imitate an adult model who either smiled, frowned,

4. For instance, if one views a mouth articulating (silently) the sound "da" and hears a voice-over with the sound "ba," one will experience "da" or sometimes an intermediate sound "ga."

* 5. MacKain et al. found that this particular audio-visual matching task was facilitated by left hemispheric activation, but discussion of that finding is beyond the scope of this book.

or showed a surprise face. The problems presented by these findings are manifold. How do babies "know" that they have a face or facial features? How do they "know" that the face they see is anything like the face they have? How do they "know" that specific configurations of that other face, as only seen, correspond to the same specific configurations in their own face as only felt, proprioceptively, and never seen? The amount of cross-modal fluency in terms of predesign is extraordinary. This is a special case, however, because one does not know whether the infant's response is imitative or reflex-like. Does the sight of a specific visual configuration of the other's face correspond to a proprioceptive configuration in the infant's own face? In this case one can talk about cross-modal correspondence (vision-proprioception). Or does the specific configuration on the other's face trigger a specific motor program to perform the same act? In that case one is talking about a specific innate social releasing stimulus. At present, it is not possible to make a definitive choice (see Burd and Milewski 1981).

Infants thus appear to have an innate general capacity, which can be called amodal perception, to take information received in one sensory modality and somehow translate it into another sensory modality. We do not know how they accomplish this task. The information is probably not experienced as belonging to any one particular sensory mode. More likely it transcends mode or channel and exists in some unknown supra-modal form. It is not, then, a simple issue of a direct translation across modalities. Rather, it involves an encoding into a still mysterious amodal representation, which can then be recognized in any of the sensory modes.

Infants appear to experience a world of perceptual unity, in which they can perceive amodal qualities in any modality from any form of human expressive behavior, represent these qualities abstractly, and then transpose them to other modalities. This position has been strongly put forth by developmentalists such as Bower (1974), Moore and Meltzoff (1978), and Meltzoff (1981), who posit that the infant, from the earliest days of life, forms and acts upon abstract representations of qualities of perception. These abstract representations that the infant experiences are not sights and sounds and touches and nameable objects, but rather shapes, intensities, and temporal patterns—the more "global" qualities of experience. And the need and ability to form abstract representations of primary qualities of per-

ception and act upon them starts at the beginning of mental life; it is not the culmination or a developmental landmark reached in the second year of life.

How might amodal perception contribute to a sense of an emergent self or a sense of an emergent other? Take the infant's experience of the mother's breast as an example. Does the baby initially experience two unrelated "breasts," the "sucked breast" and the "seen breast"? A Piagetian account would have said yes, as would most psychoanalytic accounts, since they have adopted Piagetian or associationist assumptions. The present account would say no. The breast would emerge as an already integrated experience of (a part of) the other, from the unlearned yoking of visual and tactile sensations. The same is true for the infant's finger or fist, as seen and sucked, as well as for many other common experiences of self and other. Infants do not need repeated experience to begin to form some of the pieces of an emergent self and other. They are predisposed to forge certain integrations.

While amodal perceptions will help the infant integrate potentially diverse experiences of self and other, a sense of an emergent self is concerned not only with the product but with the process of integration, as we saw earlier. Ultimately, the breast as seen and the breast as sucked will become related, whether by amodal perception, by assimilation of schemas, or by repeated association. What might the particular experience of amodally derived integration be like as an emergent experience, compared with an integration brought about by assimilation or association? Each process of relating diverse events may constitute a different and characteristic emergent experience.

For instance, the actual experience of looking for the first time at something that, on the basis of how it felt to the touch, should look a certain way and having it, indeed, look that way is something like a déjà vu experience. The infant presumably does not anticipate how an object should look and therefore has no experience of cognitive confirmation. Many would suggest that such an experience would go totally unnoticed, or that at most it would be registered nonspecifically as "all-rightness" with smooth functioning. They would further suggest that the experience would take on specific qualities only if sight happened to disconfirm the tactile information—again a cognitive perspective on the matter. I suggest that at a preverbal level (outside of awareness) the experience of finding a cross-modal

match (especially the first time) would feel like a correspondence or imbuing of present experience with something prior or familiar. Present experience would feel related in some way to experience from elsewhere. This primitive form of a déjà vu event is quite different from the process of making associational linkages, which may have more the quality of a discovery—that two things already apprehended belong together. It is likely that in this domain of emergent experience there is also the experience of premonition of a hidden future in the process of revealing a structure that can only be sensed opaquely. A typology of such events at the experiential level rather than at a conceptual level is greatly needed.

"PHYSIOGNOMIC" PERCEPTION

Heinz Werner (1948) proposed a different kind of amodal perception in the young infant, which he called "physiognomic" perception. In Werner's view, the amodal qualities that are directly experienced by the infant are categorical affects rather than perceptual qualities such as shape, intensity, and number. For instance, a simple two-dimensional line or a color or a sound is perceived to be happy (~), sad (\), or angry (ΛΛ). Affect acts as the supra-modal currency into which stimulation in any modality can be translated. This is a kind of amodal perception too, since an affect experience is not bound to any one modality of perception. All of us engage in "feeling perception"—but is it frequent, continuous, or otherwise? It is likely to be a component (though usually unconscious) of every act of perception. Its mechanism, however, remains a mystery, as does the mechanism of amodal perception in general. Werner suggested that it arose from experience with the human face in all its emotional displays, hence the name "physiognomic" perception. To date there is no empirical evidence, only speculation, about its existence or nature in young infants.

"VITALITY AFFECTS"

We have so far considered two ways in which the infant experiences the world about him. The experiments on cross-modal capacities suggest that some properties of people and things, such as shape, intensity level, motion, number, and rhythm, are experienced directly as global, amodal perceptual qualities. And Werner suggests that

some aspects of people and things will be experienced directly as categorical affects (angry, sad, happy, and so on).

There is a third quality of experience that can arise directly from encounters with people, a quality that involves vitality affects. What do we mean by this, and why is it necessary to add a new term for certain forms of human experience? It is necessary because many qualities of feeling that occur do not fit into our existing lexicon or taxonomy of affects. These elusive qualities are better captured by dynamic, kinetic terms, such as "surging," "fading away," "fleeting," "explosive," "crescendo," "decrescendo," "bursting," "drawn out," and so on. These qualities of experience are most certainly sensible to infants and of great daily, even momentary, importance. It is these feelings that will be elicited by changes in motivational states, appetites, and tensions. The philosopher Suzanne Langer (1967) insisted that in any experience-near psychology, close attention must be paid to the many "forms of feeling" inextricably involved with all the vital processes of life, such as breathing, getting hungry, eliminating, falling asleep and emerging out of sleep, or feeling the coming and going of emotions and thoughts. The different forms of feeling elicited by these vital processes impinge on the organism most of the time. We are never without their presence, whether or not we are conscious of them, while "regular" affects come and go.

The infant experiences these qualities from within, as well as in the behavior of other persons. Different feelings of vitality can be expressed in a multitude of parental acts that do not qualify as "regular" affective acts: how the mother picks up baby, folds the diapers, grooms her hair or the baby's hair, reaches for a bottle, unbuttons her blouse. The infant is immersed in these "feelings of vitality." Examining them further will let us enrich the concepts and vocabulary, too impoverished for present purposes, that we apply to nonverbal experiences.

A first question is, why do these important experiences not fit into the terms and concepts of already existing affect theories? Usually one thinks of affective experience in terms of discrete categories of affect—happiness, sadness, fear, anger, disgust, surprise, interest, and perhaps shame, and their combinations. It was Darwin's great contribution (1892) to postulate that each of these had an innate discrete facial display and a distinct quality of feeling and that these

innate patterns evolved as social signals "understood" by all members to enhance species survival.⁶ Each discrete category of affect is also generally thought to be experienced along at least two commonly agreed upon dimensions: activation and hedonic tone. Activation refers to the amount of intensity or urgency of the feeling quality, while hedonic tone refers to the degree to which the feeling quality is pleasurable or unpleasurable.⁷

Vitality affects do not comfortably fit into these current theories of affect, and for that reason they require a separate name. Yet they are definitely feelings and belong within the domain of affective experience. They will be tentatively called vitality affects, to distinguish them from the traditional or Darwinian categorical affects of anger, joy, sadness, and so on.

Vitality affects occur both in the presence of and in the absence of categorical affects. For example, a "rush" of anger or of joy, a perceived flooding of light, an accelerating sequence of thoughts, an unmeasurable wave of feeling evoked by music, and a shot of narcotics can all feel like "rushes." They all share similar envelopes of neural firings, although in different parts of the nervous system.

6. These seven or eight discrete expressions, taken alone or in combinatory blends, account for the entire emotional repertoire of facial expressiveness in man. This has come to be known as the "discrete affect hypothesis." And this hypothesis has proven very robust for over one hundred years. Well-known cross-cultural studies indicate fairly convincingly that photographs of the basic facial expressions will be similarly recognized and identified in all cultures tested (Ekman 1971; Izard 1971). Universality in the face of wide socio-cultural differences argues for innateness. Similarly, it is now well known that a child born blind shows the normally expected repertoire of facial expressions until about three to four months (Freedman 1964; Fraiberg 1971), strongly suggesting that these discrete display patterns are innate, emerging without the need of learning provided by the feedback of vision. However, when we inquire about the subjective quality of feeling associated with any facial expression, the cross-cultural fit appears to be present but less tight. The central sensation of sadness can have its own distinctive qualities as verbally expressed by one people compared with another people (Lutz 1982). We share the same finite set of affect expressions, but not necessarily the same set of feeling qualities.

7. Some affect categories such as happiness or sadness are always pleasurable or unpleasurable, but to varying degrees others, like surprise, are not. Generally, activation and hedonic tone are seen as dimensions along which categories of affects are experienced. For example, exuberant joy is the happiness category of affect experienced at the high end of the activation dimension, in contrast to, say, contemplative bliss, which is also in the happiness category but experienced at the low end of activation. Both feelings, however, could be judged to be equally pleasurable in hedonic tone. Conversely, pleasant surprise and unpleasant surprise fall at different ends of the hedonic tone dimension but could be at the same level on the activation dimension. There are other dimensions along which affect categories are thought to fall (see Arnold 1970; Dahl and Stengel 1978; Plutchik 1980).

The felt quality of any of these similar changes is what I call the vitality affect of a "rush."

Expressiveness of this kind is not limited to categorical affect signals. It is inherent in all behavior. Various activation contours or vitality affects can be experienced not only during the performance of a categorical signal, such as an "explosive" smile, but also in a behavior that has no inherent categorical affect signal value; for example, one can see someone get out of a chair "explosively." One does not know whether the explosiveness in arising was due to anger, surprise, joy, or fright. The explosiveness could be linked to any of those Darwinian feeling qualities, or to none. The person could have gotten out of the chair with no specific category of affect but with a burst of determination. There are a thousand smiles, a thousand getting-out-of-chairs, a thousand variations of performance of any and all behaviors, and each one presents a different vitality affect.

The expressiveness of vitality affects can be likened to that of a puppet show. The puppets have little or no capacity to express categories of affect by way of facial signals, and their repertoire of conventionalized gestural or postural affect signals is usually impoverished. It is from the way they move in general that we infer the different vitality affects from the activation contours they trace. Most often, the characters of different puppets are largely defined in terms of particular vitality affects; one may be lethargic, with drooping limbs and hanging head, another forceful, and still another jaunty.

Abstract dance and music are examples par excellence of the expressiveness of vitality affects. Dance reveals to the viewer-listener multiple vitality affects and their variations, without resorting to plot or categorical affect signals from which the vitality affects can be derived. The choreographer is most often trying to express a way of feeling, not a specific content of feeling. This example is particularly instructive because the infant, when viewing parental behavior that has no intrinsic expressiveness (that is, no Darwinian affect signal), may be in the same position as the viewer of an abstract dance or the listener to music. The manner of performance of a parent's act expresses a vitality affect, whether or not the act is (or is partially colored with) some categorical affect.

One can readily imagine, in fact, that the infant does not initially

perceive overt acts as such, as do adults. (This act is a reach for the bottle. That act is the unfolding of a diaper.) Rather, the infant is far more likely to perceive directly and begin to categorize acts in terms of the vitality affects they express. Like dance for the adult, the social world experienced by the infant is primarily one of vitality affects before it is a world of formal acts. It is also analogous to the physical world of amodal perception, which is primarily one of abstractable qualities of shape, number, intensity level, and so on, not a world of things seen, heard, or touched.

Another reason for separating vitality affects from categorical affects is that they cannot be adequately explained by the concept of level of activation. In most accounts of affects and their dimensions, what are here called vitality affects might be subsumed under the all-purpose, unswerving dimension of level of activation or arousal. Activation and arousal certainly occur, but they are not experienced simply as feelings somewhere along, or at some point on, this dimension. They are experienced as dynamic shifts or patterned changes within ourselves. We can use the dimension of arousal-activation only as a general index of level of arousal-activation. We need to add an entirely new categorization of this aspect of experience, namely, vitality affects that correspond to characteristic patterned changes. These patterned changes over time, or activation contours, underlie the separate vitality affects.⁸

Because activation contours (such as "rushes" of thought, feeling, or action) can apply to any kind of behavior or sentience, an activation contour can be abstracted from one kind of behavior and can exist in some amodal form so that it can apply to another kind

8. All the different activation contours can be described in terms of intensity of sensation as a function of time. Changes in intensity over time are adequate to explain "exploding," "fading," "rushes," and so on, no matter what actual behavior or neural system is the source of these changes. That is why vitality affects have been hidden within the dimension of activation-arousal. However, the activation-arousal dimension needs to be broken apart and viewed not only as a single dimension but also as more momentary patterned changes of activation in time—that is, activation contours that exist in some amodal form. These contours of activation give rise to vitality affects at the level of feeling.

This account of vitality affects is greatly indebted to the work of Schneirla (1959, 1965) and particularly of Tompkins (1962, 1963, 1981). However, Tompkins concluded that discrete patterns of neural firing (density $\times$ time)—what are here called activation contours—result in discrete Darwinian affects, while I conclude that they result in a distinct form of affective experience, or vitality affects. Nonetheless, Tompkins's work is the basis for the present account.

of overt behavior or mental process.⁹ These abstract representations may then permit intermodal correspondences to be made between similar activation contours expressed in diverse behavioral manifestations. Extremely diverse events may thus be yoked, so long as they share the quality of feeling that is being called a vitality affect. An example of such a correspondence may be the basis for a metaphor as seen in Defoe's novel *Moll Flanders*. When the heroine is finally caught and imprisoned after a life of crime, she says, "I had . . . no thought of heaven or hell, at least that went any farther than a bare flying touch. . . ." ([New York: Signet Classics, 1964], p. 247). The activation contour of her ideation reminds her of the activation contour of a particular physical sensation, a fleeting touch. And they evoke the same vitality affect.

If young infants experience vitality affects, as is being suggested, they will often be in a situation analogous to that of Moll Flanders, in which a variety of diverse sensory experiences with similar activation contours can be yoked—that is, they can be experienced as correspondent and thereby as creating organization. For instance, in trying to soothe the infant, the parent could say, "There, there, there . . .," giving more stress and amplitude on the first part of the word and trailing off towards the end of the word. Alternatively, the parent could silently stroke the baby's back or head with a stroke analogous to the "There, there" sequence, applying more pressure at the onset of the stroke and lightening or trailing it off toward the end. If the duration of the contoured stroke and the pauses between strokes were of the same absolute and relative durations as the vocalization-pause pattern, the infant would experience similar activation contours no matter which soothing technique was performed. The two soothings would feel the same (beyond their sensory specificity) and would result in the same vitality affect experience.

If this were so, the infant would be a step up in the process of experiencing an emergent other. Instead of one distinct stroking-mother and a second and separate "There, there"-mother, the infant would experience only a single vitality affect in soothing activities—

9. All of this assumes that infants are early endowed with pattern- or sweep-detectors that can identify such contours. Suggestive evidence exists that they are. Fernald (1984), for example, showed that infants can readily discriminate a rising pitch contour from a falling one, even though the two are the same voice making the same vowel sound with the same pitch range and amplitude and differing only in temporal pattern. New research in this area is crucial.

a "soothing vitality affective mother." In this fashion the amodal experience of vitality affects as well as the capacities for cross-modal matching of perceived forms would greatly enhance the infant's progress toward the experience of an emergent other.¹⁰

The notion of activation contours (as the underlying feature of vitality affects) suggests a possible answer to the mysterious question of what form the amodal representation resides in when it is held abstracted from any particular way of perceiving it. The amodal representation could consist of a temporal pattern of changes in density of neural firing. No matter whether an object was encountered with the eye or the touch, and perhaps even the ear, it would produce the same overall pattern or activation contour.

The notion of vitality affects may prove helpful in imagining some of the infant's experiences of forming organization in yet another way. The consolidation of a sensorimotor schema provides an illustration. The thumb-to-mouth schema is a good one, since it occurs quite early. Following the suggestion of Sameroff (1984), we can describe the initial consolidation of the thumb-to-mouth schema as something like this. The infant initially moves his hand toward the mouth in a poorly coordinated, loosely directed, jerky manner. The entire pattern—thumb-to-mouth—is an intrinsically motivated, species-specific behavioral pattern that tends to completion and smooth functioning as the goals. During the initial part of a successful trial, while the thumb is getting closer but is not yet in the mouth, the pattern is incomplete and there is increased arousal. When the thumb finally finds its way into the mouth, there is a falloff in arousal, because the pattern is consummated and "smooth functioning" of sucking (an already consolidated schema) takes over. Along with the decrease in arousal there is a relative shift toward positive hedonic tone upon the resumption of smooth functioning. This thumb-finding-the-mouth and mouth-finding-the-thumb occurs over and over until it is smoothly functioning, that is, until adaptation of the pattern is accomplished through assimilation/accommodation of the sensorimotor schema. When this happens and the scheme is fully

10. There are infinite possible activation contours. One can only assume that they organize into recognizable groupings, so that we can recognize families of contours for which relatively discrete vitality affects are the felt component and can even designate words—"surging," "fading," "resolutions," and so on to some of these families. The differentiation into a greater number of more discrete families is an empirical developmental issue.

consolidated, the thumb-to-mouth behavior is no longer accompanied by arousal and hedonic shifts. It then goes unnoticed as "smooth functioning." But during the initial trials, when the schema is still being consolidated, the infant experiences, for each precariously successful attempt, a specific contour of arousal buildup as the hand is uncertainly finding its way to the mouth and then a falloff in arousal and a shift in hedonic tone when the mouth is found and secured. In other words, each consolidating trial is accompanied by a characteristic vitality affect associated with sensations from the arm, hand, thumb, and mouth—all leading to consummation.

The product of this development—a smoothly functioning thumb-to-mouth schema—may go unnoticed once formed. But the process of formation, itself, will be quite salient and the focus of heightened attention. This is an experience of organization in formation. This example is not different in principle from the more familiar case of the buildup of hunger (tension, arousal), consummation in the act of feeding (arousal reduction and hedonic shift), and sensations and perceptions about self and others. However, the thumb-in-mouth case is different in that it concerns a sensorimotor schema, not a physiological need state, that its motivation is conceptualized somewhat differently, and most important for our purposes, that it gives rise to a different vitality affect associated with different body parts and different contexts.

There are many different sensorimotor schemas that need to be adapted, and the consolidation process for each of them involves a subjective experience of somewhat different vitality affects associated with different body parts and sensations in different contexts. It is these subjective experiences of various organizations in formation that I am calling the sense of an emergent self. The particular experiences of the consolidation of a sensorimotor schema may have more of a quality of tension resolution than of déjà vu or of discovery as already described for some of the other senses of an emergent self.

We have now examined three processes involved in forming a sense of an emergent self and other: amodal perception, physiognomic perception, and the perception of corresponding vitality affects. All three are forms of direct, "global" perception, in which the yoking of diverse experiences is accompanied by distinctive subjective experiences. However, that is not the only way the world of related experiences comes into being. There are also constructionist processes

that provide the infant with different ways to experience an emergent self and other. These processes are associated with a different approach to infant experience, but one that is complementary to the approach just discussed.

CONSTRUCTIONIST APPROACHES TO RELATING SOCIAL EXPERIENCES

The constructionist view assumes that the infant perceives the human form initially as one of many arrays of physical stimuli, not essentially different from various other arrays, such as windows, cribs, and mobiles. It further assumes that the infant first detects separate featural elements of persons: size, motion, or vertical lines. These featural elements, which could by themselves belong to any stimulus array, are then progressively integrated until a configuration, a whole form, is synthesized into a larger constructed entity—first, a face, and gradually a human form.

The processes that form the constructionist view are assimilation, accommodation, identifying invariants, and associational learning. The emergence of the sense of self is therefore described more in terms of discoveries about the relations between previously known disparate experiences than in terms of the process itself. While learning in one form or another, is the underlying process of a constructionist approach, what can and will be learned is channeled by innate predilections common to the species. Humans are born with preferences or tendencies to be attentive to specific features within a stimulus array. This is true for stimulation in any sensory modality. There is a developmental sequence in which the infant detects or finds most salient different features at different ages. This progression is best studied in vision. From birth to two months, infants have a tendency to seek out the stimulus features of movement (Haith 1966), size, and contour density, the number of contour elements per unit area (Kessen et al. 1970; Karmel, Hoffman, and Fegy 1974; Salapatek 1975). After two months of age, curvature, symmetry, complexity, novelty, aperiodicity, and ultimately configurations (form) become more salient stimulus features (See Hainline 1978; Haith 1980; Sherrod 1981; Bronson 1982).

Infants also come into the world with attentional (potential information-gathering) strategies that have their own maturational unfolding. Again, these have been best studied in vision. Up to two

months of age, infants predominantly scan the periphery or edges of objects. After that age, they begin to shift their gaze to look at the internal features (Salapatek 1975; Haith et al. 1977; Hainline 1978). When the object is a face, there are two important exceptions to this general progression of attentional strategy. When some auditory stimulation such as speaking is added, even infants younger than two months tend to shift their gaze from the periphery to the internal features of the face (Haith et al. 1977). The same tendency has been observed when there is movement of the facial features (Donee 1973).

Using this information to predict how the human face will be experienced in constructionist terms, we could predict roughly the following progression. During the first two months, infants should find the face no different from other objects that move, that are roughly the same size, and that have similar contour density. Infants would acquire much familiarity with the features that make up the border areas, such as the hairline, but little familiarity with the internal features of the face: the eyes, nose, mouth—in short, all the features that taken together make up its configuration or "faceness." After the age of about two months, when attentional strategy shifts to internal scanning, infants would first pay attention to those features with more of the stimulus properties they preferred: curvature, contrast, vertical symmetry, angles, complexity, and so on. These preferences would lead them to be attentive first to the eyes, then to the mouth, and last to the nose. After considerable experience with these features and their invariant spatial relationships, they would have constructed a schema or identified the invariants of the configuration that designates "faceness."

Indeed, it is readily demonstrable that by the age of five to seven months infants can remember for over a week the picture of a particular face that has been seen only once and for less than a minute (Fagan 1973, 1976). This feat of long-term recognition memory requires a representation of the unique form of a particular face. It is unlikely that it is done on the basis of feature recognition. The fact that faces make sounds and that their internal parts move in talking and expressing should push the constructionist timetable somewhat earlier, but it does not change the sequence in which the construction of form perception progresses.

This constructionist approach could be applied equally well to

audition, touch, and the other modalities of human stimulation. If one accepts the constructionist picture and timetable for the earliest perceptual encounter with human stimuli, one must conclude that the infant is not related in any distinctive or unique way to other persons. Interpersonal relatedness does not yet exist as distinct from relatedness to things. The infant is asocial, but by virtue of being indiscriminate, not by virtue of being unresponsive, as suggested by psychoanalytic formulations of a stimulus barrier that protects the infant for the first few months of life. One can entertain a notion of relatedness to isolated stimulus features or properties, but that is a weak notion indeed. The idea of relatedness to circles or spheres (or to "part objects," in psychoanalytic terms) does not seem to carry one far into the domain of the interpersonal.

The problem is, then, how and when do these constructions become related to human subjectivity, so that selves and others emerge? Before dealing with that problem, we should note that some evidence suggests that infants never experience any salient human form (face, voice, breast) as nothing more than a particular physical stimulus array among others, but rather that they experience persons as unique forms from the start. The evidence is of several kinds: (1) By the age of one month, infants do show appreciation of more global (nonfeatural) aspects of the human face such as animation, complexity, and even configuration (Sherrod 1981). (2) Infants gaze differently when scanning live faces than when viewing geometric forms. They are less captured by single featural elements and scan more fluidly during these first months (Donee 1973). (3) When scanning live faces, newborns act differently than when scanning inanimate patterns. They move their arms and legs and open and close their hands and feet in smoother, more regulated, less jerky cycles of movement. They also emit more vocalizations (Brazelton et al. 1974, 1980). (4) The recent finding of Field et al. (1982), that two- to three-day-old infants can discriminate and imitate smiles, frowns, and surprise expressions seen on the face of a live interactant, clearly indicates that the infant not only is perceiving internal facial features but appears to be discriminating some of their different configurations.¹¹ (5) The recognition of a specific individual's face or voice is supportive evidence for some kind of specialness attached to

11. It can, however, be argued that the discrimination of expressive configurations is based on the detection of a single feature necessary and sufficient for each configuration.

that person's stimuli. The evidence is convincing that the neonate can discriminate the mother's voice from another woman's voice reading the exact same material (DeCasper and Fifer, 1980).¹² The evidence for recognition of individual faces prior to two months is less secure. Many researchers continue to find it, but a larger number do not (see Sherrod 1981). Despite these qualifications of the constructionist view, there is little question that infants do construct relationships as well as perceive them directly.

Approaches to an Understanding of the Infant's Subjective Experience

Amodal perception (based on abstract qualities of experience, including discrete affects and vitality affects) and constructionistic efforts (based on assimilation, accommodation, association, and the identification of invariants) are thus the processes by which the infant experiences organization. While these processes have been most studied in perception, they apply equally well to the formation of organization in all domains of experience: motor activity, affectivity, and states of consciousness. They also apply to the yoking of experiences across different domains (sensory with motor, or perceptual with affective, and so on).

One of the most pervasive problems in understanding infants continues to be the difficulty in finding unifying concepts and language that will include the formation of organization as it occurs in the various domains of experience. For instance, when speaking about the yoking of diverse perceptions to form higher-order perceptions, we can talk in cognitive terms. When speaking about the yoking of sensory experience and motor experience, we can adopt Piaget's conceptual system and talk in terms of sensorimotor schemas. When speaking about the yoking of perceptual and affective experience, we are thrown back on more experiential concepts that are less systematized, such as those employed in psychoanalysis. All of these

yokings must draw upon the same basic processes that we have discussed, yet we tend to act as if the formation of organization follows its own unique laws in each domain of experience. And to some extent it may. But the commonalities are likely to be far greater than the differences.

There is no reason to give any one domain of experience primacy and make it the point of departure to approach the infant's organization of experience. Several approaches can be described, all of them valid, all of them necessary, and all of them equally "primary."¹³

The infant's actions. This is the route implied in Piaget's work. Self-generated action and sensations are the primary experiences. The emergent property of things, in the beginning, is an action-sensation amalgam in which the object is first constructed in the mind by way of the actions performed on it; for example, there are things that can be grasped and things that can be sucked. While learning about the world, the infant necessarily identifies many invariants of subjective experience of self-generated actions and self-sensations—in other words, of emergent self experiences.

Pleasure and displeasure (hedonic tone). This is the route that Freud initially explored. He stated that the most salient and unique aspect of human experience is the subjective experience of pleasure (tension reduction) and displeasure (tension or excitation buildup). This is the basic assumption of the pleasure principle. He assumed that visual perceptions of the environment such as the breast or face or tactile sensations or smells associated with pleasures (such as feeding) or displeasure (such as hunger) become affect-imbued. It is in this way that affective and perceptual experiences are yoked. On the surface it is an associationist's view, but Freud's version of this view was slightly different. Affects not only make perceptions relevant by way of association; they also provide the ticket of admission for perceptions even to get into the mind. Without the experience of hedonic tone, no perceptions would be registered at all. Hedonic tone did for Freud what self-generated action did for Piaget. They both "created" perceptions as mental phenomena and yoked these perceptions to primary experiences.

Do infants experience hedonic tone in the first months of life? When watching an infant in distress or contentment, one finds it very hard not to believe so. Emde (1980a, 1980b) has postulated that hedonic tone is the first experience of affect. Biologists have generally assumed that from an evolutionary standpoint, pain and pleasure or approach and withdrawal should be the primary affective experiences, for their value to survival.

12. The pitch range and general stress patterns do not appear to be the distinctive features that permit the infant to make this discrimination. Voice quality may be the best bet (Fifer, personal communication, 1984).

13. One could argue that some experiences are more crucial for survival than others, but that is outside of considerations of subjective experience.

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Further, evolution built the experience of categories of affect upon the foundation of hedonic tone (Schneirla 1965; Mandler 1975; Zajonc 1980). Emde et al. (1978) suggests that ontogeny may recapitulate phylogeny in the progression of affective experience. In this light it is interesting that Emde et al. report that in interpreting the facial expressions of the youngest infants, mothers feel most confident about their attribution of hedonic tone, somewhat less confident about level of activation, and least confident about the discrete category of affect seen on the infant's face.

Discrete categories of affect. Even if hedonic tone emerges earlier or faster as an affective experience, the study of infants' faces also makes clear that they express (whether or not they feel) discrete categories of affect. Using detailed film analysis, Izard (1978) observed that newborns show interest, joy, distress, disgust, and surprise. Facial displays of fear appear at about six months (Cicchetti and Sroufe 1978), and shame appears much later. Affect is expressed not only in the face, in the beginning. Lipsitt (1976) has described how newborns express anger by moving the face, arms, and whole body in concert when they experience lack of air from nasal occlusion at the breast. In a similar vein, Bennett (1971) has described how the infant's entire body expresses pleasure; there are quiverings of pleasure as well as smiles.

We simply do not know if infants are actually feeling what their faces, voices, and bodies so powerfully express to us, but it is very hard to witness such expressions and not to make that inference. It is equally hard theoretically to imagine that infants would be provided initially with an empty but convincing signal, when they need the feelings they express to regulate themselves, to define their very selves, and to learn with.¹⁴

Infant states of consciousness. In the first months of life, the infant cycles dramatically through the sequence of states first described by Wolff (1966): drowsiness, alert inactivity, alert activity, fuss-cry, regular sleep, and paradoxical sleep. It has been suggested that the different waking states of consciousness may also serve the role of an organizing focus for all other experiences, and accordingly they provide a primary approach for describing early infant subjective experience (Stechler and Carpenter 1967; Sander 1983a, 1983b).

Perceptions and cognitions. This is the route most often taken by experimentalists. It results in a view of the infant's social experience as a

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subset of perception and cognition in general. Social perception and social cognition follow the same rules applicable to all other objects.

The problem with each of these approaches is that infants do not see the world in these terms (that is, in terms of our academic subdisciplines). Infant experience is more unified and global. Infants do not attend to what domain their experience is occurring in. They take sensations, perceptions, actions, cognitions, internal states of motivation, and states of consciousness and experience them directly in terms of intensities, shapes, temporal patterns, vitality affects, categorical affects, and hedonic tones. These are the basic elements of early subjective experience. Cognitions, actions, and perceptions, as such, do not exist. All experiences become recast as patterned constellations of all the infant's basic subjective elements combined.

This is what Spitz (1959), Werner (1948), and others had in mind when they spoke of global and coenesthetic experience. What was not recognized at the time of their formulations was the extent of the infant's formidable capacities to distill and organize the abstract, global qualities of experience. Infants are not lost at sea in a wash of abstractable qualities of experience. They are gradually and systematically ordering these elements of experience to identify self-invariant and other-invariant constellations. And whenever any constellation is formed, the infant experiences the emergence of organization. The elements that make up these emergent organizations are simply different subjective units from those of adults who, most of the time, believe that they subjectively experience units such as thoughts, perceptions, actions, and so on, because they must translate experience into these terms in order to encode it verbally.

This global subjective world of emerging organization is and remains the fundamental domain of human subjectivity. It operates out of awareness as the experiential matrix from which thoughts and perceived forms and identifiable acts and verbalized feelings will later arise. It also acts as the source for ongoing affective appraisals of events. Finally, it is the ultimate reservoir that can be dipped into for all creative experience.

All learning and all creative acts begin in the domain of emergent relatedness. That domain alone is concerned with the coming-into-being of organization that is at the heart of creating and learning. This domain of experience remains active during the formative

14. During the last decade, developmental psychologists have tended to stress the cognitive capacities required for an infant to have an affective experience (Lewis and Rosenblum 1978). The result has been an overemphasis on the linkage between the development of cognitive structure and affect. The realization is now occurring that not all affective life is the handmaiden to cognition, either for infants or for adults, and that infants' feelings, especially in the beginning, can and must be considered irrespective of what they know. (See Demos [1982a, 1982b]; Fogel et al. [1981]; and Thoman and Acebo [1983] for a discussion of this issue in relation to infants, and Zajonc [1980] and Tompkins [1981] in relation to adults.)

period of each of the subsequent domains of sense of self. The later senses of self to emerge are products of the organizing process. They are true, encompassing perspectives about the self—about the physical, actional self, about the subjective self, about the verbal self. The process of forming each of these perspectives, the creative act concerning the nature of self and others, is the process that gives rise to the sense of an emergent self, which will be experienced in the process of forming each of the other senses of the self, to which we can now turn.

Chapter 4

The Sense of a Core Self: I. Self versus Other

AT THE AGE of two to three months, infants begin to give the impression of being quite different persons. When engaged in social interaction, they appear to be more wholly integrated. It is as if their actions, plans, affects, perceptions, and cognitions can now all be brought into play and focused, for a while, on an interpersonal situation. They are not simply more social, or more regulated, or more attentive, or smarter. They seem to approach interpersonal relatedness with an organizing perspective that makes it feel as if there is now an integrated sense of themselves as distinct and coherent bodies, with control over their own actions, ownership of their own affectivity, a sense of continuity, and a sense of other people as distinct and separate interactants. And the world now begins to treat them as if they are complete persons and do possess an integrated sense of themselves.

In spite of this very distinctive impression, the prevailing views of clinical developmental theory do not reflect the image of an infant with an integrated sense of self. Instead, it is widely held that infants go through an extended period of self/other undifferentiation and that only very slowly, sometime towards the end of the first year of life, do they differentiate a sense of self and other. Some psychoanalytic