Implications of Research on Infant Development for Psychodynamic Theory and Practice

CHARLES H. ZEANAH, M.D., THOMAS F. ANDERS, M.D., RONALD SEIFER, Ph.D., AND DANIEL N. STERN, M.D.

Abstract. Recent research on infant development is reviewed to consider its implications for psychodynamic theory and practice. To address the question of the importance of early experiences for development, research on continuities and discontinuities in development, temperament, motivational systems in infancy, affect development and regulation, development of the sense of self, and infant-caregiver attachment are reviewed. Two major implications emerge, both emphasizing the need for more complexities in our conceptualizations. First, research on infant development underscores the importance of context in development and cautions about the limits of reductionistic thinking and theories. Second, a major paradigmatic shift away from the fixation-regression model of psychopathology and development is indicated. A new model that better fits available data is proposed instead. In this continuous construction model, there is no need for regression, and ontogenetic origins of psychopathology are no longer necessarily tied to specific critical or sensitive periods in development. Implications for psychodynamic treatment are also described. J. Am. Acad. Child Adolesc. Psychiatry, 1989, 28, 657-668. Key Words: psychodynamic theory, infant development, sense of self, fixation-regression.

Freud (1940) described the infant's relationship to his or her mother as "unique, without parallel, established unalterably for a whole lifetime as the first and strongest love object and as the prototype for all later love relations" (p. 188). Following in this tradition, most other psychodynamic theorists have accorded a vitally important role to infancy and early relationship experiences. In the last 25 years, an increasing number of methodologically rigorous studies on infant development have yielded results that contribute significantly to psychodynamic assertions about the nature and consequences of early experiences. Although many important questions remain, and controversies abound, a coherent picture is emerging. In this selective review of research on infant development, we discuss two major themes germane to psychodynamic theory and practice.

The first theme concerns the importance of context in development and emphasizes the continuing and mutually reciprocal transactions between individual and environment. Recognizing the multi-determined interactive complexities of development and psychopathology requires moving beyond reductionistic thinking and theory building. This perspective is particularly important to emphasize during the current period of dramatic advances by neuroscientists and molecular biologists. What has been learned about development from infancy research strongly suggests that searching for the causes of disordered behavior and personality organization in genetic markers and biochemical defects will never provide the complete picture. Whatever contributions the synaptic cleft and the receptor make to psychopathology are more meaningfully considered within the larger contexts in which they are imbedded. From the standpoint of infant development, this theme of contexts highlights the importance of early infant-caregiver relationship experiences.

Research on infant development has led to the second theme, that is, supplanting drive theory's fixation-regression model with a continuous construction model of development and psychopathology. Traditionally, psychodynamic theory has considered relationship experiences to be organized by the oral, anal, and phallic libidinal stages or modes of relating. Psychopathology is understood to derive from regression to fixation points, the latter resulting from constitutional vulnerabilities and/or from infantile traumas within certain critical or sensitive periods. This fixation-regression model of psychopathology also guides treatment. Psychoanalysis or psychoanalytic psychotherapy proscribes gradually uncovering the original trauma or fixation point so that it may be worked through. In this conceptualization, the ontogenetic origin of psychopathology arises from the particular libidinal stage of development in which there is a trauma or a constitutional weakness.

In the continuous construction model, patterns of internal subjective experience and patterns of relating to others are derived from past relationship experiences but are continuously operating in the present. The model is "continuous" in two senses. First, it alludes to dynamic, ongoing transactions between individual and environment throughout development. Second, continuous refers to the overall coherence of an individual's sense of self and personal history, as well as the coherence of his or her relationship patterns. This coherence implies both repetition of previous patterns and a tendency to resist change.

The shift from a fixation-regression model to a continuous construction model has important implications for the ontogenetic origins of psychopathology and for the conduct of psychotherapy. The most important difference in the continuous construction model and the fixation-regression model is that the former does not specify the point of origin of various forms of psychopathology or link them to particular developmental phases. Instead, it leaves the question of putative
origin open, allowing each issue's origin to emerge from each patient's own particular life story. Since the pattern is ongoing, "ingression" (rather than regression) into salient clinical issues in the here and now occurs through the transference relationship.

Since both the fixation-regression model and the continuous construction model imply some degree of continuity between early and later experiences, the concept of developmental continuities and discontinuities is reviewed. Then how continuity relates to empirical findings on infant temperament, motivational systems, and affect development is discussed. Next, because the sense of self integrates these domains of development and is closely linked to subjective experience, continuities and discontinuities in the early development of self are reviewed. Specifically, two major theoretical models of self development that have been drawn from infancy research are reviewed and their differing psychological implications are considered. In keeping with the recognition that continuity in infant development is even clearer at the level of relationship patterns, theoretical and empirical work on patterns of infant-caregiver attachment relationships and their implications for the importance of early experience are described. In the concluding section, the implications of these research results for conceptualizing psychopathology and conducting psychotherapy are highlighted.

Continuities and Discontinuities in Development

Belief in the importance of early "traumatic" experiences in the formative years of infancy and an interest in identifying individuals at risk for later psychiatric disorder has led investigators to search intensively for significant continuities in development. The medical model of psychopathology led early psychoanalytic theorists to predict that psychological traumas and biological propensities lead to predictable sequellae and consequences. Contrary to expectations, one of the major results of the search for continuities in behavior has been the recognition that discontinuities in early development are far more readily apparent than continuities (Emde and Harmon, 1984; Rutter, 1987). This, coupled with evidence of adequate coping in some resilient children and adults despite adverse early experiences, has led some to ascribe little, if any, significance to experience in the early years (Kagan, 1984a; Clarke and Clarke, 1976).

An initial conundrum for developmentalists interested in continuities has been the widespread recognition that major periods of developmental reorganization occur during the first two years of life. These biobehavioral shifts are rather discrete epochs during which biological, cognitive, affective, and social characteristics of the infant reorganize and subsequently emerge as qualitatively new capacities of greater complexity (Emde et al., 1976; Emde, 1985). These changes have been widely recognized and extensively reviewed elsewhere (McCall et al., 1977; Kagan, 1984b; Emde, 1985; Stern, 1985a). The major features of the biobehavioral shifts are summarized briefly below.

Around 2 to 3 months after birth, a variety of behavioral changes may be observed. Although the total amount of sleep does not change dramatically, a diurnal cycle of sleep/wake appears, with brief waking periods becoming consolidated into longer daytime bouts of wakefulness and sleep periods becoming more prolonged and shifted to the night. Many infants begin for the first time to sleep through the night. Enhanced cognitive abilities are evident by more rapid learning in habituation, classical conditioning, and operant conditioning. Even more striking for parents are the social and affective changes. Soon after crying or "colicky" behavior begins to diminish, infants begin to make prolonged eye-to-eye contact and smile and coo responsively in the presence of a human face (Emde and Harmon, 1972; Emde et al., 1976).

The next period of reorganization occurs at around 7 to 9 months of age. Biological changes permit postural and locomotor advances. In the cognitive domain, infants develop a rudimentary understanding of means-ends differentiation, along with intentionality, object permanence, and a sense of anticipation. Affectively, the consolidation of these advances is accompanied by the onset of a specific attachment to a primary caregiver, manifest in part by separation reactions and stranger wariness.

At 12 to 13 months, more changes appear. Cognitively, infants have a new appreciation of the independence of entities in the world. Mobility is greatly enhanced by the infant's beginning to walk, further contributing to a new sense of the infant as a more autonomous individual. Affective advances are evident by the appearance of social referencing to resolve uncertainty (Campos and Stenburg, 1981). Affects begin to be used instrumentally by the infant (Klinnert et al., 1984), and affect attunement by caregivers provides the infant with a richer experience of empathy (Stern, 1985b).

The final transformation in the first 2 years occurs at 18 to 20 months. Symbolic representation dramatically advances, and language becomes increasingly preferred as a means of communication. For the first time, infants understand consistently that words are an agreed upon means of designating objects and later events. Self-awareness, gender recognition, and the capacity for self-reflection first become evident. Advances in peer relatedness soon follow these other developments.

Each of these developmental transformations leads to qualitative shifts in biological, cognitive, affective, and social organization, changing both how the infant experiences the world and how others experience the infant (Stern, 1985a). Recognition of these developmental discontinuities suggests that simple links between early and later behaviors are unlikely. Development means inevitable changes in both the individual and the environment. The widely accepted transactional model of development (Sameroff and Chandler 1975) describes the process by which the infant is changed by environmental influences even as he or she influences and changes that environment. The continuing, mutually reciprocal relationship between infant and environment requires an understanding of continuity as a product of this increasingly complex process and underscores the importance of considering infant development within its environmental context. Research reviewed below on temperament, motivational systems, and affect development addresses some of the complexities of early development as they affect continuity as a basic psychodynamic principle. In addition, the review draws attention to important components of subjective experience that provide the foundation for an individual's sense of personal, historical continuity.
Temperament

Investigators of infant temperament initially hoped to describe early, stable manifestations of personality. Following the approach of Thomas, Chess, and colleagues (Thomas et al., 1963), most investigators and theorists have considered temperament to be the style by which individuals behave in different situations over time, attempting to capture the essence of those behaviors that comprise personality. Temperamental dimensions refer to behavioral tendencies rather than discrete behavioral acts (Goldsmith et al., 1987). Typically, temperament has been aligned with the notion of personality traits rooted in an individual's biology (Goldsmith et al., 1987).

Research in behavioral genetics have examined parent-child, sibling, and twin concordances, measured by parental reports. Overall, results indicate a significant contribution of genetic factors to temperament (Plomin, 1987). Several dimensions of temperament appear to have genetic contributions, including emotionality, activity, and sociability (Buss and Plomin, 1984). Interestingly, stability of inherited traits may actually increase with increasing age, pointing to the complexity of gene-environment interaction (Scarr and Kidd, 1983; Plomin, 1987). In a similar manner, studies of behavioral inhibition (shyness) have demonstrated continuity in selected extreme samples from 2 to 6 years of age. A number of biological correlates of this characteristic also have been demonstrated (Kagan et al., 1988).

The major methodologic problem for temperament research has been concern about the adequacy of parental reports for assessing children's temperaments. Parents have been shown to have systematic biases in their ratings based on their social class, race, anxiety level, and mental health status (Sameroff et al., 1982; Vaughn et al., 1987). To a degree, parents also develop preconceived notions even before their children are born as to what their temperaments will be (Zeanah et al., 1985, 1986a; Mebert and Kainiwsky, 1986). Mother-father-observer agreements about temperament are only moderate or less (Hubert et al., 1982; Field and Greenberg, 1982; Zeanah et al., 1986b), perhaps reflecting the generally low (about 0.25) agreement among different informants who have different roles with a particular child (Achenbach et al., 1987). The basic question from these studies remains, is continuity in the infant's behavior or in the perception of the informant?

Clinically, the most important construct to emerge from temperament research is that of infant difficulty (Bates, 1980), although there has been considerable debate about its meaning and measurement (Bates, 1980; Thomas et al., 1982; Bates, 1983; Carey, 1986; Zeanah et al., 1986c). Adverse temperamental characteristics in infancy, if stable, provide an opportunity for early identification of individuals at risk for subsequent psychopathology. The problem has been that evidence for continuity of temperamental traits is equivocal at best, especially when measured in infancy (Hubert et al., 1982).

Despite these conceptual differences and shortcomings in assessment, temperament remains a compelling if frustratingly elusive construct. From the clinical standpoint, the major point about temperament is that direct links between temperament types and psychiatric disorders are limited, although there are scattered findings relating both parental reports and laboratory assessments of temperament to some clinical conditions (Rothbart and Goldsmith, 1985; Carey, 1986; Rosenbaum et al., 1988). These links are greatly strengthened when the infant's temperament is considered in context (Graham et al., 1973; Cameron, 1978). Wolkind and DeSalis (1982), for instance, found that 4-month-old infants with difficult temperaments were significantly more likely to be behavior disordered at age 3 years if their mothers were clinically depressed.

All of these results have led to interest in considering temperament in the context of the parent-child relationship. Thomas, Chess, and colleagues (Thomas et al., 1963, 1968) originally formulated the "goodness-of-fit" construct, emphasizing the interaction between parental responses and differing infant temperamental types in the production of disordered behavior. Seifer and Sameroff (1986) expanded this model to integrate more systematically the contextual factors associated with parental responses to and interpretation of differing behavioral styles in young children. As a result, their model highlights the importance of the subjective experiences of parent and infant and emphasizes the importance of context in understanding early development and its disorders. Research on infant temperament underscores the fallacy of theoretical models that attempt to explain development and psychopathology without sufficient attention to context.

Motivational Systems

As a result of infancy research, motivational systems in infancy have been expanded beyond the libidinal and aggressive drives proposed by Freud. One of the domains of motivation that recent infancy research has described compellingly is curiosity. From the moment of birth, infants actively and preemtporily seek stimulation, especially social stimulation (Stern, 1977; Anders and Zeanah, 1984). Since Wolff's (1966) seminal work on the importance of the state of alert inactivity for learning, a host of investigations using paired comparison and habituation paradigms have capitalized on infant preferences for novelty to discover other infant capacities. Stern (1985a) cites evidence from such paired comparison paradigms indicating that under conditions of novelty, even young infants would rather look than eat, underscoring the importance of curiosity as a basic motivational system. Infants possess inborn biases and preferences for certain types of stimulation, along with a tendency to explore, to form and test hypotheses about what is occurring in the world (Brunner, 1977; Kagan et al., 1978; Lamb and Sherron, 1981; Lipsitt, 1983).

Another closely related area of research on basic motivational systems is mastery motivation. Research on mastery motivation was inspired by White's (1959) theory of effectiveness motivation, a relatively early divergence from accepted psychoanalytic theory on the nature of drives. White believed that individuals are intrinsically motivated to explore and to master their environmental contexts. His position was congruent with Hunt's (1965) view of infants as motivated, active constructors of their environments. Following in this tradition, Harter (1978) developed a theoretical model that links environmental consequences of mastery behavior with indi-
individual differences in self-esteem. Specifically, contexts that encourage and reinforce attempts at mastery are believed to promote positive feelings of self-efficacy and internal perceptions of control.

White, Hunt, and Harter emphasized the universal aspects of mastery motivation as a behavioral characteristic of the species. Yarrow and colleagues (Yarrow et al., 1983) began a series of studies of infants in the first year of life to determine individual differences in the degree and manner in which mastery motivation was expressed. Their strategy for measuring mastery motivation was to present a series of toys that emphasize production of effects, sensorimotor practice, or problem solving to infants, and to assess the degree to which the infants explored and mastered the situation with a minimum of adult guidance. Clear individual differences in attention, persistence, exploration, and task success were demonstrated in these studies (Yarrow et al., 1983; Morgan and Harmon, 1984). Further, these differences have been related to developmental status, handicapping conditions, and interactions with parents (Jennings et al., 1988; Macturk et al., 1985; Yarrow et al., 1982, 1984). In addition, it appears that goal-directed behavior, rather than task success, is related to self-efficacy as manifest in contingent positive affect displays (MacTurk et al., 1987).

Some theoreticians, particularly in the field of self psychology, have asserted that the overarching motivational system driving behavior is a feeling of competence (Basch, 1988). In this line of reasoning, competence subsumes curiosity, mastery, effectance, and even sex and aggression as a superordinate construct. Competent behavior is the external goal and self-esteem is the internal goal in this important motivational system.

Sroufe and colleagues have inspired a growing body of research on the development of social competence in infants and toddlers (Sroufe and Waters, 1977; Matas et al., 1978; Waters and Sroufe, 1983). Two major points are emphasized in their work. First, social competence is defined as the flexible and effective use of available personal, social, and physical resources to achieve goals (Waters and Sroufe, 1983). Second, infant behaviors are examined in terms of their organization (Sroufe and Waters, 1977); that is, patterns of behavior instead of isolated behaviors are assessed. Crucial is the appreciation, familiar to clinicians, that individual infant behaviors have different meanings in different contexts and at different developmental periods. Behaviors are considered intimately tied to the important relationships of the child in various contexts and in different developmental periods. Meaningfully organized patterns of behavior are more stable and predictive than individual behaviors alone (Sroufe and Waters, 1977; Waters, 1978; Sroufe, 1983).

Two year olds' effective use of social support is an important ingredient in their ability to function competently in problem solving tasks. This includes seeking help when needed and at times rebuking unnecessary interference by adults. Individual differences in dyadic interaction in this regard are readily demonstrable (Matas et al., 1978) and are predictive of later peer relationships (Sroufe, 1983).

Recent investigations have taken a more integrative approach to studying mastery and competence in infancy. Frodi et al. (1985) have found that security of attachment at 1 year predicts mastery behavior 8 months later. Maternal control styles and sensitivity also affected mastery behavior of 1-year-old infants (Grolnick et al., 1984). Following these leads, Seifer et al. (in press) have developed a model of social competence in toddlers that emphasizes the integration of security of attachment, mastery motivation, affect expression, modulation and self-control, and task success.

The most important psychodynamic implication of these research findings concerns the maintenance of self-esteem. Research in this area points to infants' motivation by curiosity and the desire to explore, by the urge to master, and by the desire for competence to behave in ways that maintain self-esteem. In other words, evidence suggests a variety of behaviors that are more usefully explained by other motivational systems rather than as discharges of excess psychic energy. And maladaptive behaviors can be explained in terms other than compromise solutions to conflict situations.

Affect Development and Regulation

Research on infants and adult-infant relationships indicates that throughout development, emotions regulate behavior, internal processes, and social interactions (Barrett and Campos, 1987). For example, much as Freud speculated, fear helps the individual avoid dangerous situations, activate the fight-flight response, and alert others to the presence of danger. This research also supports traditional psychodynamic theory about the role of emotions in personality formation and about their importance in clinical treatment (Emde, 1988a, b).

The impetus for research on affect development comes from demonstrations of ontogenetic changes in facial expressions and the recognition of seven discrete emotions—joy, sadness, anger, fear, surprise, disgust, and interest—in extensive cross-cultural studies (Izard, 1971; Ekman et al., 1972). The implication of this work is that parents and infants are biologically predisposed to display and to interpret certain emotional expressions in one another and to interact on the basis of these interpretations.

Further work demonstrates that facial expressions of emotions show regularity in their form and time of emergence. Both parents and objective observers reliably recognize facial expressions in infants in the first year of life (Emde, 1985, 1988a). In fact, interest, disgust, and physical distress are readily demonstrable at birth and have specifiable elicitors and predictable interactional consequences (Izard and Malatesta, 1987). In the first 7 months of life, the maturation of surprise, sadness, anger, and fear appear to be primarily biologically programmed, although social experiences may have great influence as early elicitors and contingent reinforcers of these actions.

Emotional expressions are especially important motivators and regulators of social behavior. In early infancy, caregiver responses are differentially influenced by infant expressions of emotions (Malatesta, 1981), and infants are in turn influenced by the caregiver's affective expressions (Tronick et al., 1986). With the maturation of higher order central nervous system inhibitory mechanisms and the development of more complex cognitive abilities, emotional expressions become increasingly subject to control. They also become increasingly useful as a means of regulating the behavior of others. Al-
though many caregivers already may interpret infant affect expressions as intentional in neonates (Kaye, 1982), they still recognize a qualitative change towards the latter part of the first year as they begin to perceive infants using their emotional expressions instrumentally to obtain desired goals (Klinnert et al., 1984).

The importance of the emotional availability of caregivers to their infants has been stressed by many psychodynamic theorists and investigators (Bowby, 1969/1982; Mahler et al. 1975; Ainsworth et al., 1978; Emde and Easterbrooks, 1985; Sroufe, 1988). Recent research with 1-year-olds has demonstrated that in situations of uncertainty, infants look to their caregivers for help in evaluating their emotional reaction to the uncertainty. This form of emotional signaling has been termed social referencing (Campos and Stenberg, 1981; Klinnert et al., 1982). Social referencing, which occurs at a time when the infant might have more difficulty with evaluating the safety and consequences of his or her own actions and the new meanings of a variety of environmental events, appears to be an important precursor of real self-awareness (Emde, 1985).

Infants begin to label their own feeling states towards the end of the second year of life (Bretherton and Beeghly-Smith, 1982). Together with capacities for self-awareness, this period marks the initial appearance of an observing ego. The child can have one feeling and simultaneously think about another feeling and deal with it symbolically, opening up new possibilities for complexity and for conflict between internal experience and external expression. There is substantial evidence that infants can learn to deny emotional expression of ongoing feelings, thus dissociating expression and feelings (Kozell and Campos, 1987; Izard and Maletesta, 1987).

The significance of continuity of emotional development has been stressed most explicitly by Emde (1985). He suggests that it is an individual's emotional experiences that give a sense of identity throughout development. Being able to access our own feelings consistently gives us a sense of familiarity about who we are despite many changes over time. Further, because this "affective core" is rooted in biology, it provides a means by which we are able to appreciate the feelings of others and to relate to others empathically. In other words, the affective domain provides an important component of the continuous construction model. Whether affect deserves the central or merely an important place in memory and the subjective sense of continuity is controversial (Stern, 1988), but few would disagree that one of the most compelling continuities posited is an individual's sense of self.

**Development of the Sense of Self**

Development of the sense of self is fundamental to a discussion of infant development because it is in the individual's identity that the domains of temperament, motivational systems, competence, and affect become integrated. There is an increasing consensus that organizational features of the sense of self give coherence and continuity to individual experience (Damon and Hart, 1986). Although Horney (1951), Kohut (1977), Kernberg (1975), and other psychoanalytic theorists have described the sense of self from the adult perspective, infancy research has fostered new and important theories about the early development of the sense of self. Rather than reviewing in detail the voluminous research with infants bearing on self development, we present a review instead of the two major conflicting theoretical perspectives, Mahler's (Mahler et al., 1975) theory of separation-individuation and Stern's (1985a) theory of self development. These theories share a central focus on the infant's sense of self and on the overarching clinical issues of being alone and being with others as fundamental human concerns. Nevertheless, their implications for psychodynamic theory and practice lead us in different directions. The theory of separation-individuation is fully compatible with drive theory's fixation-regression model, but the self development theory of Stern illustrates the continuous construction model. As a result, they necessarily provide different and incompatible views of the course of self development, the origins of psychopathology, and the strategies of psychotherapy.

Compatible with empirical findings that self-awareness develops at about 18 months (Lewis and Brooks-Gunn, 1979) is the influential theoretical work on self development that began with Mahler and her colleagues (Mahler et al., 1975). Based on extensive, longitudinal observations of a small sample of middle-class mothers and children, together with clinical experiences with older psychotic children, Mahler and her colleagues elaborated a widely known theory of self development. They proposed that an infant's psychological birth is a gradual process that extends throughout the first 2 years after physical birth. The gradual discovery of self-awareness and independence from the mother was described as the process of separation-individuation. For the first 2 months, infants are in a normal autistic phase, in which physiological processes are dominant over psychological processes. From 2 to 6 months, in the normal symbiotic phase, the infant "behaves and functions as though he and his mother were an omnipotent system—a dual unity within a common boundary" (Mahler et al., 1975, p. 44).

Following this phase, the process of separation-individuation begins. During the initial phase of differentiation, the infant "hatches" out of the "symbiotic orbit" and begins to make initial tentative moves away from the mother. These moves are increased during the next phase of practicing, as the infant's burgeoning motor abilities and increased interest in the object world lead to longer periods of time playing away from the mother. With cognitive advances in the middle of the second year, infants' awareness of separateness grows. This dawning awareness of separateness and loss of omnipotence that characterize the rapprochement crisis are accompanied by an affective shift in the infant from joyous intoxication to increased petulance and sadness. Infant ambivalence about fusion and separateness during this period is inferred from the well-described behavioral patterns of "shadowing" the mother and alternately "darting away" from her. Following resolution of the rapprochement crisis, infants begin to accept their separateness in the phase designated on the way to object constancy.

Despite the richness of Mahler's descriptions, the lack of methodological rigor has left unanswered the question of whether the observations merely confirmed investigator biases or critically tested specific hypotheses (Minde, 1981, 1982). The theory of separation-individuation also appears both to
overestimate and to underestimate the capacities of infants in the first 2 years of life (Horner, 1985; Stern, 1985a; Horner, 1988). A wealth of research has established the infant's active engagement with the world immediately after birth, which is incompatible with Mahler's connotations of "autistic" disinterest in, or avoidance of, human contact (Peterfreund, 1978; Lichtenberg, 1983; Horner, 1985; Stern, 1985a). Mahler's description of symbiosis too readily ascribes to infants capacities for symbolic functioning (i.e., those necessary for hallucinatory wish-fulfillment), that are well beyond anything that has been demonstrated in infants at this age and also ignores what is known about capacities for differentiation (Horner, 1985; Stern, 1985a). Feeling omnipotent is also incompatible with infants' everyday perceptual experiences (Horner, 1985) and requires sophisticated reality-distorting capacities in the subjective experience of very young infants. Contrary evidence suggests that in infancy the reality principle precedes the pleasure principle, meaning that defensive operations, in the infant's own self.

Each of the five capacities is the physical self that is experienced as a coherent, willful, bounded physical entity with a unique affective life and history belonging to it. Stern cites a wealth of empirical support for the infant's capacity for self-agency, self-coherence, self-affectivity, and self-history necessary for a core sense of self. The infant quickly learns that regulation of his or her emotional states is dependent upon others (adult caregivers), but even self-with-other experiences still belong entirely to the infant's own self.

Following the first biobehavioral shift at 2 to 3 months, another sense of self is added to the first. The core sense of self is the physical self that is experienced as a coherent, willful, bounded physical entity with a unique affective life and history belonging to it. Stern cites a wealth of empirical support for the infant's capacity for self-agency, self-coherence, self-affectivity, and self-history necessary for a core sense of self. The infant quickly learns that regulation of his or her emotional states is dependent upon others (adult caregivers), but even self-with-other experiences still belong entirely to the infant's own self.

After the second and third biobehavioral shifts, the infant's new capacities for sharing attention, intentions, and affective states with an other (all of which have ample empirical support) ushers in the subjective sense of self. With this addition to the emergent sense of self and the core sense of self, the infant experiences a dramatic advance in relatedness. For the first time, the infant is aware of his or her ability to match and to mismatch mental states with an other.

The verbal sense of self emerges after the onset of the final biobehavioral shift in the first 2 years. This new sense of self involves the ability to reflect on oneself and to use language to communicate about oneself to others. The advantages of the verbal sense of self in vastly expanding the infant's experiences and relatedness are obvious, but Stern also points out a darker side of this new sense of self. The infant experiences the limitations of language in rendering experiences, particularly those experienced in the domains of the other three senses of self. "Language forces a space between interpersonal experience as lived and as represented. And it is exactly across this space that the connections and associations that constitute neurotic behavior may form" (Stern, 1985a, p. 182).

In the third or fourth year of life, the infant begins to use language for more than objectifying and labeling. For the first time, the infant demonstrates an ability to narrate his or her own life story. This momentous achievement marks the beginning of an ability to change how one views oneself that is essential for psychodynamic psychotherapy. The narrative sense of self describes the new domain of experience that constructs a story from a variety of elements (e.g., actor, action, intentions, instrumentality, and context) drawn from other senses of self (Stern, 1989a, b). The narrative self requires a qualitatively different mode of thought from problem solving or other kinds of talking. Although it is not yet clear why or how children begin to construct an autobiographical history, it is clear that this history becomes the life story that an adult patient initially presents to a therapist.

Unlike most other developmental theories that involve sequential phases or stages, Stern's suggests that, once formed, the senses of self operate continuously and simultaneously. None of them is necessarily dominant at any time in development nor is any one necessarily linked to a particular clinical issue. Furthermore, subjective experience throughout development is organized not by phase-specific clinical issues such as orality, attachment, or mastery, but instead by the emergent, core, subjective, verbal, and narrative senses of self. Regression is unnecessary in this conceptualization, because of the continuing presence and growth of each of the five senses of self throughout the lifespan. This is precisely the continuity implied by the continuous construction model.

These two major theories of self development agree about the importance of the individual's subjectivity and the centrality of the sense of self in any attempt to understand development. Both conceptualizations address the fundamental human problem of being with others and being alone, and they view this problem as a central organizer of human experience. They also share much agreement about salient clinical issues such as autonomy and what it feels like to be with another. Nevertheless, the nature of the individual's subjectivity is radically different in the two systems. In addition to vastly different conceptualizations of individual experience, the theories of Mahler and Stern also understand
the origins of psychopathology differently. Mahler's work illustrates the fixation-regression model of psychopathology, with later problems understood as repetitions of infantile traumas. Further, the form of later pathology is determined by the sensitive period of self development in which the trauma occurred. Stern's conceptualization, on the other hand, illustrates the continuous construction model, in which there is no regression but only ingress into an ongoing sense of self that is appropriate to a particular clinical issue. The form of later pathology is not necessarily related to the developmental period in which it occurred originally. Since the self emerges in the context of the parent-infant relationship, a fundamental issue for both models is the degree to which early relationships experiences become internalized within the self during development.

Internal Representations and Relationship Patterns

Another domain in which continuity has been recognized amidst change is in patterns of relationships between infants and their caregivers (Sroufe and Fleeson, 1986). A central tenet of virtually all psychodynamic theories has been the notion that adults recreate early relationship experiences in subsequent relationships. The "compulsion to repeat" was originally described by Freud (1920) in the context of neurotic repetitions of maladaptive behaviors. The degree to which the childhood experiences of an individual are important influences on that individual's subsequent parenting behavior, and the factors that increase or decrease the likelihood of repetition, are of enormous clinical relevance. Relationship continuity and repetition imply some capacity in infants to internalize and carry forward relationship patterns. Recent research has attempted to operationalize the construct of internal representations of relationship experiences in order to explain how infants experience and reenact relationship patterns.

Internal representations are essentially memory structures that represent a version of lived experience to an individual. Stern (1985a) has outlined the process by which they are formed. The infant lives a particular experience, and, when it is over, the experience is instantaneously transformed into a memory. After the infant has lived a number of similar experiences, each of which has been transformed into a particular memory, the infant abstracts an average version of the experience. This abstract average of related memories of experiences is an internal representation. This is analogous to the development of natural categories of objects in memory that has been described by Rosch et al. (1976) and of generalized event representations described by Nelson and Gruendel (1981).

There is an increasing consensus that internal representations are organized hierarchically from small units reflecting subjective experience to increasingly large networks reflecting more global appraisals (Stern, 1985a, 1989a, b; Bretherton, 1985, 1987). These large networks, termed "working models" by Bowlby (1969/1982), not only re-present lived experience, but also are presumed to perceive and interpret incoming information selectively, to generate anticipations, and to guide behavior in relationships. They are not merely passive filters of experience but contribute towards an individual's active recreations of relationship experiences (Zeanah and Anders, 1987). This assumes a constructive, narrative view of memory and recall, consistent with recent research in cognitive psychology (Reiser et al., 1985).

Relationship Patterns in Infants

The cross-model perceptual capacity in young infants described earlier implies that a primitive representational capacity exists even at birth. Other evidence supports the notion that infants "internalize," or retain patterns of experience in the first few months of life. During one phase of face-to-face interactions with their 3-month-old infants, mothers were instructed to "look depressed" (Cohn and Tronick, 1983). Infants became disorganized and distressed in response and, interestingly, they continued to exhibit distressed behavior for a period of time after their mothers resumed normal interaction with them. Further, when infants of clinically depressed mothers were compared to infants of nondepressed mothers in the same interactional paradigm, the infants of nondepressed mothers became significantly more distressed during the "look depressed" phase of interaction (Field, 1984). This suggests that the depressed appearance of the nondepressed mothers was a greater violation of expectation than the depressed appearance of the clinically depressed mothers.

Other empirical support relevant to the construct of internal representations and the intergenerational transmission of relationships has come from investigations of attachment in infants and adults (Sroufe and Fleeson, 1986). Inspired by the ethologic-attachment theory of Bowlby (1969/1982, 1973, 1980), Ainsworth et al. (1978) developed the most widely used assessment of attachment relationships, a laboratory paradigm known as the Strange Situation. This procedure involves a series of increasingly stressful episodes for 11- to 20-month-old infants. On the basis of the organization (rather than the content) of the infant's reunion behavior with respect to the caregiver following a brief separation, it is possible to classify the infant's pattern of attachment to that caregiver. According to attachment theory, infants should use their attachment figures as a secure base to explore the novel environment provided by the Strange Situation. Following the caregiver's return, an infant should seek to reestablish interaction with the caregiver and, if distressed, should seek comfort from the caregiver. When infants behave in this manner, they are classified as securely attached to that caregiver. In contrast, some infants seem surprisingly undistressed by their caregivers' leaving and actively avoid them on return, ignoring the caregiver's bid for interaction and attending instead to toys. The relationship between these infants and caregivers is termed avoidant. Other infants protest vigorously when their caregiver leaves the room during the Strange Situation procedure, but they behave ambivalently when their caregivers return, alternately demanding contact and then resisting it. Relationships characterized by this pattern are termed ambivalent.

What is being classified is not simply a temperamental trait of the infant, as some have suggested (Chess and Thomas, 1982; Chess, 1984; Kagan et al., 1987). If infants are assessed in the Strange Situation with different caregivers, they behave differently depending on the quality of attachment to the caregiver with whom they are assessed (Main and Weston, 1981; Belsky et al., 1984; Grossman et al., 1985). Independ-
ence of Strange Situation classifications of the same infant with different caregivers emphasize that attachment classifications are relationship specific. Obviously, this does not preclude the possibility that temperamental traits exert indirect effects on attachment classification, through effects on caregivers’ sensitivity and responsivity, for example. Nevertheless, Strange Situation classification apparently reflects the infant’s view of his or her relationship with a specific caregiver at a particular point in time (Hinde, 1982).

Strange Situation classifications are preceded by characteristic patterns of caregiver interactive behavior at home during the preceding year. The most consistent finding is that caregivers who are sensitive and responsive (i.e., consistently nurturant, attentive, and nonintrusive while interacting with their infants) have secure attachment relationships with them at 1 year (Ainsworth et al., 1978; Egeland and Farber, 1984; Belsky et al., 1984; Grossman et al., 1985). Because Strange Situation classifications are preceded by certain interactive patterns at home, they may be understood as “summary outcome scores” of infants’ relationship experiences with primary caregivers in the first year of life. The working hypothesis of attachment theory is that these summary scores reflect the infant’s internal representation of the relationship with a particular caregiver.

Infant attachment classifications derived from behavior during the Strange Situation procedure are apparently stable. Under conditions of low stress and adequate support, the infant’s classification with the caregiver remains stable between 12 and 18 months (Waters, 1978; Main and Weston, 1981; Belsky et al., 1984). When attachment classification changes from secure to insecure, it is related to an increase in stresses or a decrease in supports (Vaughn et al., 1979; Thompson et al., 1982). In other words, factors that would be expected to disrupt caregiver-infant relationships and therefore to change infant representations of those relationships have been demonstrated to affect them in predictable ways.

In support of psychodynamic assertions about carrying forward relationship patterns, attachment classification of infants predicts subsequent psychosocial adaptation (Strober, 1988). Infants who are securely attached to their primary caregivers at 12 months of age are more autonomous at age 2 years (Matas et al., 1978), have more advanced symbolic play development (Slade, 1987), are more socially competent with peers and more ego-resilient (flexible, self-reliant, curious, involved) in preschool and kindergarten years (Arend et al., 1979; Waters et al., 1979; Troy and Strober, 1987; Oppenheim et al., 1988). School-aged children previously classified as securely attached demonstrate more competent overall functioning (Main et al., 1985), higher self-esteem (Cassidy, 1988), and less psychopathology (Lewis et al., 1984; Erickson et al., 1985) than those previously classified as insecurely attached.

Internal Representations in Adults

Believing that individual differences in internal representations of attachment ought to be measurable in adults as well as infants, Main and her colleagues provided a second major conceptual and methodological advance in attachment research. George et al. (unpublished manuscript) developed a measure to classify adults’ description of their own childhood attachment relationships. The Adult Attachment Interview inquires about early relationships, separations, losses, and other attachment-relevant experiences. Scoring relies not on the content of the adult’s descriptions, but rather on the organization of thoughts and feelings, and qualitative aspects of descriptions. Thus, whether an adult describes early experiences and relationships as good or bad is less important than the degree to which the adult has integrated these experiences, as reflected in having access to memories and feelings regarding significant attachment figures and experiences and coherently describing these early events and experiences.

Following the attachment classification system of the Strange Situation for infants, adults are classified as dismissing of attachment (corresponds to avoidance in infants), autonomous with respect to attachment (corresponds to secure in infants), or preoccupied by past attachments (corresponds to ambivalence in infants). Adults classified as autonomous value relationships, maintain a balanced view of their role in relationships and a tolerance for imperfection in themselves and others and are coherent in describing early experiences. Adults classified as dismissing or preoccupied lack these qualities. The dismissing group describes attachment relationships as unimportant or claim to be unaffected by them and often have difficulty remembering early experiences. The specific memories they do recall often contradict their idealized global descriptions of experiences. The preoccupied group still seems dependent upon and overly concerned with their families and early experiences and are often still struggling to please family members. This group generally exhibits considerable difficulty providing a coherent depiction of relationships or experiences.

Intergenerational Continuity

If the Strange Situation measures the “infant side” of the attachment relationship and the Adult Attachment Interview measures the “adult side” of the attachment relationship, then psychodynamic assertions about intergenerational transmission lead us to expect convergence in the measures. Indeed, as Main and Goldwyn (1984, 1989) have pointed out, there are striking parallels in the patterns of infant behavior in the Strange Situation procedure and the patterns of adult patterns of language, thought, and memory in the interview. For instance, adults classified as dismissing turn their attention away from attachment relevant information during the Adult Attachment Interview, while simultaneously asserting their independence. They emphasize the normalcy of their experiences and minimize adversity or the effects of adversity. In similar fashion, infants classified as avoidant turn their attention away from their caregiver in the Strange Situation, as if they are dismissing the importance of the parent, their relationship to the parent, and their own need for comfort. Infants classified ambivalent are either angrily inconsolable or passively ineffective during the reunion episodes of the Strange Situation, and adults classified preoccupied are angrily engaged in an unsuccessful struggle to please their parents or passively incoherent about poorly defined childhood experiences.

Recent investigations with the Adult Attachment Interview have examined the agreement between adults’ classifications in the Adult Attachment Interview and their children’s classification to that adult in the Strange Situation. In a prelimi-
nary investigation, Main et al. (1985) found a 76% agreement between mothers' AAI classification and their children's Strange Situation classification measured 5 years previously. Eichberg (1987), who interviewed mothers 6 to 12 months after their infant's were observed in the Strange Situation, found an 82% exact agreement between mothers' attachment classifications and the classification of their infants' relationships to them. Results from these investigations and the parallels in infant and adult behavior described above imply that the caregivers and infants share similar patterns of processing attachment information and of affective arousal; in other words, similar internal representations of their relationship. These similarities in how caregivers and their young children represent their relationship provide valuable preliminary insights into the process by which relationship patterns may be carried forward across generations.

Mothers' attachment classifications are overwhelmingly more insecure in clinical populations (Crowell and Feldman, in press; Benoit et al., in press) and are related to their interactive behaviors with their young children (Crowell and Feldman, in press). These findings provide preliminary evidence that internal representations of attachment in adults may be meaningful indices of how they relate as caregivers to their children. In terms of the continuous construction model, internal representations occupy a pivotal position between internal subjective experience and outward interactional behavior. As such, they become a major focus of treatment.

**Discussion**

The foregoing review highlights significant areas of research demonstrating that infants in the first 3 years of life are well organized to respond to, interact with, and actively engage their environment. These capacities develop in orderly patterns with discrete developmental shifts in levels of function and adaptation that change both the infant's experience of the environment and the environment's experience of the infant. Discontinuity in individual behaviors occurs within the subjective continuity of the infant's developing sense of self and the stability of early relationship patterns. But what are the implications of these findings for current theory and practice?

The transactional model of development has provided an understanding of psychopathology that takes us beyond the linear causality of nature-nurture dualism. Current research in infancy has substantiated the view that reductionistic approaches to understanding behavior are not likely to be successful. Development requires both nature and nurture, and it is the context in which these experiences interact that require understanding in order to predict subsequent psychopathology. Even with continuities in developmental processes that are obvious, such as the social deficits in autistic children, it is the fit between continuously present markers, biological and environmental, that contributes substantially to outcome. Contexts are especially important in infancy, when psychiatric disorders are less clearly localized within an individual and more appropriately within an infant's specific important relationships (Anders, 1989). These relationships provide the initial organizing context in which the fit between individual subjective experience and environmental demands occurs.

From the psychodynamic perspective, the question is not merely whether biological propensities or environmental stressors lead to maladaptive behavior, but, also, are the disturbances fixed, or can they be altered by therapy or by other forms of treatment? Emde (1988b) has called the discrepancy between the fixed rigidity of neurotic character pathology on the one hand, and the paucity of demonstrable behavioral continuities in individual infants on the other, the central developmental paradox. The key to understanding this paradox is in the recognition that continuities are at the level of subjective experience and relationship patterns rather than individual behaviors. An infant who avoids his or her mother after a brief separation at 12 months of age will be more dependent on the preschool teacher and more likely to victimize classmates. This same infant is also at increased risk for subsequent psychopathology (Sroufe, 1983; Erickson et al., 1985; Troy and Sroufe, 1987). Continuity in this case is clearly not at the level of individual behaviors in the infant but in the relationship pattern with the primary caregiver and the internal insecurity that colors his or her subjective experience.

A related question with origins in early psychoanalytic theory asks whether single traumatic early experiences inexorably alter subsequent behavior. There is increasing evidence from the research literature that massive psychological and/or physical trauma experienced by individuals at any age have long-lasting effects on behavior (Eth and Pynoos, 1985). Nevertheless, especially in early infancy, single traumatic events have limited effects. More important are the ongoing contexts in which these traumatic events occur. Early, brief separations from caregivers and abrupt weanings, for instance, are considered far less traumatic for development than disordered relationships involving the infant in a pattern of insensitive caregiving. Context provides the arena in which environmental stresses interact with individual biological propensities to shape individual personalities with unique vulnerabilities and invulnerabilities.

As described in this review, current research in infancy also supports a paradigm shift away from the fixation-regression model and toward the continuous construction model of development and psychopathology. Various clinical issues may originate at any point in development and exert their influence on self experience or relationship experiences. Emphasis is on the individual's ongoing dynamic patterns of internal representations and interpersonal relationships. This conceptualization has important implications for treatment, as well.

If a patient's major conflictual themes are no longer tied to specific phases of development but instead are derived from the reconstructed "moments" that emerge in the patient's reported life story, then psychotherapy with adults must become more individualized (Stern, 1985a). Preconceived formulations concerning ontogenetic origins of psychopathology are no longer valid. For example, control conflicts no longer imply inevitable anal trauma. Furthermore, recovering the putative origins of clinical trauma is useful only to the extent that it enables the individual to make changes in the here and now, to challenge representational distortions, and to gain some conscious control over current behavior. The link with the past may be most useful in helping the individual appreciate the model that guides his or her current behavior and to
evaluate more consciously its appropriateness in the present, especially as regards intimate relationships and providing for the young. In treating children, the focus is less on retracing origins and meanings of specific symptomatic behaviors and more on changing current environmental contexts that support the maladaptive behavior or symptomatology.

Since the crucial for early experiences is actually the context of primary relationships, the construct of relationship psychopathology has become the focus of therapeutic attention. The transference relationship both with the therapist and with significant others in the individual's life continues to be the model for this process. The characteristics that underlie the primary attachment relationship, namely emotional availability, dependability, empathic attunement, sensitivity to developmental needs, and provision of comfort and security, are also prerequisites of the therapeutic relationship (Peterfreund, 1983). The therapist's presence, availability, and sensitivity provide opportunities for intense relationship experiences that provide a context for understanding the individual's current internal representation of intimate relationships.

The complexities of human development are mirrored in the complexities of psychotherapy. Just as there is no single determinant of psychopathological behavior, there is also no single therapy that can resolve every disorder. Multiple therapeutic approaches are frequently necessary, depending upon the particular psychopathology. Infancy research, however, supports the psychodynamic assertion that amelioration of relationship pathology requires therapeutic relationship experiences, with particular strengths implicit in the transference relationship as a major potential vehicle for change.

Whether the psychotherapeutic process can foster significant changes in those aspects of personality and psychopathology that derive from internal representations, or whether psychotherapy merely provides understanding of individual patterns of vulnerability and invulnerability remains controversial. Psychotherapy with children and families have demonstrated how difficult it is, even at an early age, to induce significant characterologic changes. Even removing young children from extremely pathological environments and placing them in more optimal settings does not provide magical transformations of personality or behavior. Simplistic therapeutic interventions are as limited as unitary etiologic formulations. Complex, multidetermined problems in development require complex, multimodal solutions. The contribution of psychodynamic psychotherapy seems best suited to recreating the context of early development in order to reset the level of vulnerability and invulnerability for disordered behavior.

References
Emde, R. N. (1988b), Development terminable and interminable II.


