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Attachment and development: A prospective, longitudinal study from birth to adulthood

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Abstract
There is much to digest in a 30 year longitudinal study of the developing person (Sroufe, Egeland, Carlson, & Collins, 2005a). The following paper summarizes some key points regarding the place of infant attachment in the developmental course. It is argued that understanding the role of attachment entails grasping the organizational nature of the attachment construct and embracing a non-linear transactional model. Using such concepts, attachment history was shown in the Minnesota study to be clearly related to the growth of self-reliance, the capacity for emotional regulation, and the emergence and course of social competence, among other things. Moreover, specific patterns of attachment had implications for both normal development and pathology. Even more important than such linkages, however, study of the place of early attachment in later adaptation reveals much about developmental processes underlying both continuity and change. Findings are overviewed concerning the complex links between attachment and ultimate outcomes and the preservation of early patterns even during times of change. In all, these findings have implications both for future research and for clinical application.

Keywords: *Attachment, continuity, developmental process, early experience and development, developmental organization*

> Behavior is quite as much a matter of growth as is stature. Its qualitative variants and their permutations and combinations are beyond human reckoning; yet their organization and patterning is at all times unitary and coherent (Goodenough, 1945, p. vii).

Introduction

For 30 years we have been wrestling with a key question in developmental psychology; namely, do individual patterns of adaptation emerge in a coherent manner, step-by-step, beginning in infancy (Sroufe et al., 2005a)? While there are many ways to characterize our study and to frame its theoretical roots, one clear goal was to evaluate in a systematic way the major propositions of attachment theory.

It is well known that Bowlby put forward two central hypotheses; first, that individual differences in the quality or effectiveness of infant–caregiver attachment relationships were largely the product of the history of interaction with the caregiver, and second, that variations in attachment quality were the foundation for later individual differences in personality. We

set out to test both of these hypotheses, with emphasis on the second one because it was so much the more prodigious task, requiring a 30-year rather than a 1-year study.

It may not be as widely known that Bowlby also proposed a particular viewpoint on development. This was a non-linear, transactional model, akin to various systems perspectives (e.g., Fogel, 1993; Sameroff & Chandler, 1975; Thelen, 1989) and to Gottlieb's (1971) concept of probabilistic epigenesis. Bowlby's viewpoint is most succinctly summarized by a quotation from the second volume, where he says that the developmental pathway chosen ''... turns at each and every stage of the journey on an interaction between the organism as it has developed up to that moment and the environment in which it then finds itself'' (Bowlby, 1973, p. 412). In this viewpoint, it is not only presumed that both history and present circumstances are important, but also that established patterns of adaptation may be transformed by new experiences while, at the same time, new experiences are framed by, interpreted within, and even in part created by prior history of adaptation. Bowlby's was a dynamic view of development.

In addition to examining the validity of Bowlby's more specific hypotheses, we sought to illustrate the heuristic value of this rich and complex viewpoint on development. These tasks actually are interrelated. To show convincingly, for example, that infant attachment variations lead to variations in personality, one must carry out a complex, multifaceted longitudinal study of children, their families, and their surrounding circumstances, with ongoing assessments each and every step of the way. Only in this way can one control for potentially confounding factors that could equally well explain any obtained outcomes. Jointly studying the history of adaptation and changing circumstances age by age was part of our strategy from the beginning.

The problem of continuity

The problems we faced as we began our study were the very same as those being faced by developmental psychology as a whole in the mid-1970s. There was general agreement that individuals differed at every age. The problem was in agreeing how such variations should be characterized and, in particular, within what conceptualization of variation (if any) would it be possible to show continuity from one age to the next in such individual differences. Without being able to get a handle on the problem of continuity, it would not seem likely that variations in infant attachment could possibly predict later variations in personality. As it turned out, conceptualizations of individual differences in attachment put forward by Bowlby and Ainsworth not only provided a means for measuring attachment quality but presented clues for solving the continuity problem as well. The continuity problem, and keys to its resolution, may be illustrated by considering some brief descriptions of individual variations in infancy and at ages 2 and 5 years.

Some infants, those that Ainsworth referred to as secure in their attachment, show a smoothly functioning balance between attachment and exploratory behaviors (Ainsworth, Blehar, Waters, & Wall, 1978). In a moderately novel setting, with the primary caregiver present, they become eagerly involved with available toys, perhaps sharing their play but not requiring constant reassurance. When left briefly by the caregiver, either first with a stranger or later alone, they may or may not be frankly distressed. In any case, they are affected by the separation and their exploration suffers. Moreover, they are active in reconnecting when the caregiver returns, either immediately seeking physical proximity or contact or actively showing toys, greeting, or otherwise interacting with the caregiver. This activity on the part of the infant is effective and leads to a return to play and exploration. Some other infants, those referred to as showing anxious/resistant attachment, may show an undue focus on the

caregiver even with minimal external stress and may seek unremitting contact when stress is greater, or they may show weak and ineffective efforts to alleviate their distress. Others still, those who show anxious/avoidant attachment, may be ineffective in using the caregiver as a base for comforting or reassurance following clear stress (as when being left alone). In the case of either anxious group, exploration is clearly compromised, especially in reunions following separations. Once such variations in attachment patterns were pointed out by Ainsworth, they were readily apparent to others.

Likewise, we have described variations in behavior of toddlers in a tool problem-solving situation, in the presence of their primary caregivers. Some 2-year-olds approach the problems with great enthusiasm. They show obvious joy in task mastery, and they are eager and persistent. When their own resources are exhausted, they effectively seek help and support from their caregivers. Others, in the same tool problem situation, give up quickly after only weak efforts, or become easily frustrated, and are fussy, whine a great deal, or are petulant. Still others may fail to seek help they need, ignore their caregiver's suggestions, or even seek help from the experimenter instead of the caregiver. They may be oppositional or passively non-compliant when help is offered. These, too, are striking and obvious variations.

Finally, some 4½-year-olds observed in a preschool setting are enthusiastic participants in the peer group and are well regarded by teachers. They approach and respond to the overtures of other children with positive affect, are empathic when others are in distress, and can sustain coordinated interactions. They can both lead and follow. They are a delight to teachers because of this social competence and because they readily follow classroom rules and flexibly adjust their behavior to fit the particular circumstances. They are self-directed and yet respond eagerly to activities introduced by teachers. Other preschoolers, in contrast, are isolated or aggressive, or impulsive and unresponsive to socialization, or are unduly reliant on the teachers for nurturance and guidance. Again, such individual differences are well known to teachers and obvious to observers.

In presenting these variations in child behavior as we have, and by beginning with Ainsworth's descriptions of *patterns* of behavior in infancy, the continuity problem is already partially solved. To see this, consider for a moment the trait-like characterizations of infant behavior that preceded Ainsworth. Some infants were described as crying or vocalizing a lot or a little, others as seeking a lot or a little proximity, and so forth, without regard to context. But such frequencies were shown to be highly unstable across both time and situations (e.g., Masters & Wellman, 1974; Waters, 1978). Clearly, assessed this way they could not predict variations of interest in the preschool years and beyond. In fact, it is unlikely that any infant behavior, without reference to context and its organization with regard to the caregiver, could predict later behavior very well. Infant behaviors are not only temporally unstable in the short run, but they also change notably with development. Clinging to a caregiver is quite common in 12-month-olds who have been briefly left alone in a novel setting; it is rare with 3-year-olds and almost never happens with 5-year-olds. Emotional dependency, in general, shows dramatic developmental changes. Infants are *supposed* to be highly dependent. It is a natural, universal state in infancy. Seeking physical closeness and contact is normative and functional. Five-year-olds do not need physical reassurance nearly as much. Predicting dependency in preschool from variations in infant dependency would thus seem very difficult, and indeed it is (Kagan & Moss, 1962). As contrasting examples, aggression and empathic responsiveness to peers are quite common at age 5 years, but not at all common in the first year. Linear predictions, based on frequencies of isomorphic behaviors, would again seem doomed. Infants have neither the capacity for genuine prosocial behavior or for intentional, hostile aggression. However, at the level of patterns of

behavior, as we have described them at the three age periods, continuity of individual functioning may still obtain. Indeed, in our work we have demonstrated strong linkages across ages using such characterizations. Even differences in dependency, aggression, and empathy in the preschool and middle childhood periods, key aspects of emerging personality, are strongly predictable from infancy when Ainsworth's patterns of behavior are used (Sroufe et al., 2005a).

An organizational perspective on development

We formalized and extended Ainsworth's concept of patterns of behavior into what we have referred to as an "organizational perspective" on development (e.g., Sroufe, 1979; Sroufe & Waters, 1977; Sroufe, Waters, & Matas, 1974). A major premise of this perspective is that the central feature of behavior is its organization: with other behaviors, with regard to context, and with regard to the salient issues of a particular developmental period. The meaning of a behavior depends on when and in what circumstances it occurs, what other behaviors are occurring concurrently, and what its function is in the ongoing adaptation of the organism. Further, development is best characterized as changes in behavioral organization, not simply the addition of behaviors. Finally, salient individual differences, those with significance for subsequent functioning, are best defined in terms of differences in the organization of behavior with regard to the developmental challenges of the particular era.

Our task, then, was to draw upon the literature to conceptualize the salient issues of each developmental period, to define constructs at the appropriate level of complexity for capturing organization with respect to these issues, to define and assess patterns of behavioral organization that were functional and non-functional, and then to examine continuity in functioning. While this appears to be straightforward, the task is made more challenging by the fact that complexity of organization increases with age. What could one measure in infancy that would be at a commensurate level of complexity for predicting patterns of individual adaptation in later childhood, adolescence, or adulthood? As anticipated by Ainsworth and others (e.g., Sander, 1975), the answer was that the organization of the behavior of the infant–caregiver dyad was at this level of complexity. Our hypothesis, as was Bowlby's, was that the quality, nature, and effectiveness of the infant–caregiver behavioral organization would forecast the later evolving, complex organization that we know as personality.

In our approach, we defined each age in its own terms. We did not attempt to measure infant–caregiver attachment at each age (though we did assess attachment representation at multiple times). Our goal was not to demonstrate the stability of attachment, but rather to illustrate the coherent emergence of the self or personality. Thus, we defined a changing set of issues, ranging from self-regulation, curiosity, and effective entry into the peer group in preschool, to real-world competence, loyal friendships, and coordination of friendship and group functioning in middle childhood, to identity, intimacy, and self-reflection by late adolescence. The proposal was that if the issues are properly chosen at each phase, and if individual variations with regard to these developmental issues are properly assessed, then the particular organization shown by individuals in facing the challenges of one age will forecast probabilistically the pattern of organization shown at the next.

We adopted a hierarchical view of development (see Werner, 1948). Functioning in each phase of development incorporates and builds upon prior adaptation yet, in facing emerging issues of a new period, the possibility of fundamental transformation remains. In fact, in articulating our view of the process of development (Sroufe et al., 2005a, Chapter 11), we have pointed out that development will always involve drawing on prior adaptation, and thus

entail continuity, and yet continuity, because of development, always entails change. Our hierarchical viewpoint leads to a particular position on the saliency of attachment. We view attachment in the context of a number of important functions played by parents, peers, and siblings (Sroufe, Egeland, Carlson, & Collins, 2005b). Many of the important functions fulfilled by parents (e.g., providing guidance and limits, socialization of emotional expression, supporting relationships with peers, etc.) are not part of the attachment system and are best not assimilated to it. Nonetheless, even within this broadened view, attachment is critical and has a central place in the hierarchy of development because of its primacy. The infant–caregiver attachment relationship is the core, around which all other experience is structured, whatever impact it may have. Thus, we came to a position that early experience is never lost, however much transformation occurs in later development.

As will be seen below, in our elaborated view of development the role of attachment is therefore not trivialized. Recognizing, for example, the important role of peer experiences in forging many aspects of social competence, does not negate the place of attachment (Sroufe et al., 2005b). In fact, it opens up new ways to think about the impact of attachment on social competence, to more powerfully predict mature variations in social functioning by combining measures of attachment and peer experience, and to emphasize a concern with developmental process. As it turns out, sometimes attachment exerts its influence indirectly by supporting early effective commerce with peers which then enables the learning and practicing of many important attitudes and skills. Sometimes attachment history and peer experiences each predict independently to certain social outcomes, with great combined power. Finally, there are certain aspects of social functioning that are more closely related to attachment history and others that are more closely related to prior peer experiences. Such findings help us understand more about the nature and functions of both peer relationships and of attachment itself. Promoting such understanding was more important to us, and we believe to Bowlby, than was merely demonstrating that attachment was important. The Minnesota study was carried out with an eye on the place of attachment in the broader process of development.

Outline of the Minnesota study

In the mid-1970s, we recruited an urban sample of more than 200 mothers who were viewed as being at moderate risk for parenting difficulties due to the challenges associated with poverty. Since poverty was not yet entrenched in our community, risk status was not as severe as in some urban communities, but the problems of stress, hardship, and instability for many in this sample led us to expect more than the usual percentages of anxious attachment than those found in middle-class samples. This appraisal was confirmed, with the specific finding that at 12 months we had more than double the frequency of anxious/resistant cases than is typically reported (22% vs. 10% or less). Later, when we were able to score disorganized attachment, this too was elevated in our sample (30%).

A primary focus of the study was, of course, assessment of the early caregiver relationship. We studied both the antecedents of attachment, through observations of infant–caregiver interaction at two points in the first half-year, and the quality of the formed attachment relationship. We used Ainsworth's exact method, and we made our assessments at both 12 and 18 months. This not only allowed the opportunity to examine continuity and change in attachment quality, but, by combining the two assessments, we could achieve a more robust predictor for later parts of the study. Having two assessments was of more importance given the likely instability of our sample. Having these properly conducted attachment assessments, however, was only one prong of what was required in attempting to

demonstrate consequences of attachment variations for personality formation. Numerous controls were essential. Thus, there were 3 key features of our study.

Comprehensive measures. It was essential to measure other salient features of the developmental landscape for two reasons. First, we had to control for factors that could possibly explain any attachment–outcome relationships. In some cases this meant ruling out third factors that could account for both attachment and outcome. Therefore we had measures of IQ, education level, maternal personality, infant temperament, cognitive development, and so forth. Other variables were potential mediators; that is, they could explain how attachment was linked to a certain outcome. Prominent here were measures of representation and of peer relationships. Our second interest in comprehensive measurement was that we expected that outcomes would be best predicted when attachment assessments were combined with other predictors. This was amply borne out.

Age-by-age assessment, beginning before birth. Within a transactional model, beginning assessments early is critical. As a notable example, with few exceptions it is difficult to know to what degree a putative temperament measure is capturing endogenous variation or, more reasonably, a complex product of infant and environment interacting over time. The later a temperament measure is obtained the less legitimate is the claim that it is a ''child'' variable. And in our study, we found that immutable temperament markers (e.g., minor physical anomalies) had no predictive power. Beginning early also is important with regard to parental measures. For example, measures of parent expectations, if not obtained before the birth of the first child, may, of course, also be based in actual experiences with the child and not be solely reflections of parental personality. Because we were interested in developmental process, and change as well as continuity, we also found it to be essential to do very frequent assessments. For example, we had 13 direct observational assessments between birth and 30 months, and frequent assessments thereafter throughout childhood and adolescence and into adulthood. The typical assessment entailed interviewing caregivers (and later teachers as well), obtaining questionnaire data, carrying out formal testing, obtaining data from records, and carrying out observations in the home or the laboratory. The availability of direct observational measures at multiple points in time was a hallmark of our study. Thus, our information about what parents say about their parenting, and what parents and teachers say about children, could be corroborated with direct observation of both parenting and child functioning.

Development in context. The infant's development is inextricably tied to the care that surrounds it. In the same way, the care that caregivers provide is dependent upon the nature of the surrounding stresses and supports. We emphasized the caregiving context in our study for two reasons: first, we wanted to make it clear from the outset that the emphasis on quality of care in shaping development was not conceived within a concept of blaming parents. The parents we studied were striving to do the best they could for their children. When one grasps the critical importance of contexts, the pointlessness of blaming parents is immediately obvious. Second, we emphasized context because of our interest in change. By showing that quality of attachment and other aspects of adaptation improve or worsen as supports and challenges for the family increase and decrease, we not only confirm that parents are not free-standing entities. We also gain some insight into the developmental process. We can track the ease or difficulty of change at different points in development, individual variations in ease of change, and what we refer to as the fate of early experience following developmental change. In addition to surrounding aspects of context, we also

looked at features of context that are more commonly viewed as caregiver characteristics, most notably depression. As with changes in stress, we found that waxing and waning of depression was associated with changes in child adaptation (Sroufe et al., 2005a). The impact of fluctuations in any of these aspects of context was one way that we had open to us to show that outcomes we were studying could not be simply ascribed to genetic influences.

One of the major strengths of this study was the capacity to examine the impact of various perturbations on developmental trajectories, in the context of varying developmental histories. Some challenges are devastating to almost anyone, while some are only a problem for those whose competence is otherwise challenged or those who are vulnerable as a consequence of earlier history. Who you are depends on both who you were *and* the challenges faced in the present.

The origins of attachment variations

In our study we affirmed Bowlby's hypothesis and Ainsworth's empirical finding (e.g., Ainsworth et al., 1978) that infants who were securely attached had a history of more sensitive and cooperative interactions than did those who were anxiously attached. This conclusion was based on observations of feeding and play, at ages 3 and 6 months in the home (see Egeland & Farber, 1984; Sroufe et al., 2005a). There was a comparably low level of sensitivity for both those infants who developed avoidant attachments and those who developed resistant attachments. However, resistant cases were associated with lower levels of psychological awareness in mothers and developmental lags in the infants. In contrast, infants who later showed avoidant attachment had been very robust as newborns, in no way compromised neurophysiologically. Their caregivers, however, as a group "had negative feelings about motherhood, were tense and irritable, and engaged in caregiving in a perfunctory manner" (Sroufe, 2005a, p. 98). Moreover, a form of maltreatment, designated as "psychological unavailability," was strongly associated with avoidant attachment. These mothers showed a paucity of emotional engagement with their infants. At 18 months, each of the infants from this psychological unavailability group showed the avoidant pattern (Egeland & Sroufe, 1981). We view our findings as consistent with previous reports by Ainsworth (Ainsworth et al., 1978) and by Isabella (1993) that caregivers of those who later show avoidant attachment routinely rebuff their infants at times when they are needy and seeking physical closeness. In accord with other research (e.g., NICHD ECCRN, 1997), we did not find variations in attachment security to be well predicted by any of our temperament measures. However, in contrast to previous studies finding that newborn difficulties are over-ridden in a middle-class sample (Crockenberg, 1981), we found that non-optimal neurological status on the Brazelton neonatal exam did predict anxious/ resistant attachment in our risk sample. Moreover, we uncovered an interesting interaction between newborn irritability and sensitive care. Caregiver sensitivity had a stronger effect for infants who were low in irritability. Caregivers in our sample had a difficult time compensating for neurologically non-optimal infants. Also, irritability was related to sensitivity at 6 months, with sensitivity totally mediating the effect of irritability on later attachment security. This was a general pattern in our study; rarely did we find any direct effects of infant temperament, especially when based on direct observation, with a vast range of outcomes. But we did on occasion find noteworthy interactive effects between temperament and caregiving (Sroufe et al., 2005a).

We also conducted comprehensive analysis of the origins of disorganized attachment (Carlson, 1998; Sroufe et al., 2005a). Consistent with the theorizing of Main and Hesse (1990), we found that disorganization was strongly predicted by caregiver intrusiveness and

by maltreatment, including physical abuse and psychological unavailability. While intrusiveness (doing things to the baby for which the baby was not prepared) and physical abuse likely would be frightening and therefore disorganizing, emotional unavailability might be viewed as making it difficult for the infant to organize attachment behavior in the first place. Of critical importance, we provided major evidence for the discriminant validity of disorganization, in that it was *not* predicted by prenatal or perinatal problems, infant anomalies, temperament, non-optimal neurological status, or early infant behavior ratings. Thus, disorganized attachment appears to be a reflection of particular qualities of the relationship history and is not simply a reflection of inherent infant neurological status.

Major predictions from infant attachment

The presentation of the major findings regarding the developmental sequelae of variations in infant–caregiver attachment relationships will be presented in three parts. We will first discuss general differences between those with secure and those with anxious histories. Here we will focus specifically on the clearest hypotheses derived from Bowlby's theorizing, those concerning self-reliance, emotional regulation, and social competence. Second, we present the evidence we have obtained on differential social and emotional outcomes for different types of anxious attachment, focusing first on comparing those with avoidant and resistant attachment histories. Finally, we discuss outcomes in the domain of psychopathology, including the apparent consequences of disorganized attachment.

Secure vs. anxious attachment

The growth of self-reliance. One of the most clear and the boldest of Bowlby's (1973) hypotheses was that secure attachment relationships were the foundation for "the growth of self-reliance"; that is, infants who were effectively dependent in that they were able to use their caregivers as a secure base for exploration would later be more independent. Those who had ineffective or anxious attachment relationships, including those pushed toward precocious independence as infants, later would be more dependent and less self-reliant. In terms of Ainsworth classifications, then, both members of the anxious/resistant group and the anxious/avoidant group, who others might see as precociously independent, were predicted to be higher on dependency later in childhood. Our study provided strong support for this hypothesis on multiple occasions, based upon both teacher reports and our own observations in school and summer camp settings.

Our strongest findings came from our nursery school project, where we were able to run our own classrooms and have abundant data from multiple sources (live observation, videotape, teacher ratings). For example, we were able to observe large numbers of contacts between teachers and pupils, noting both initiator and context, and we kept records of seating arrangements in every circle time (see Sroufe, Fox, & Pancake, 1983; Sroufe et al., 2005a). Not only were children with anxious histories, both avoidant and resistant, dramatically more reliant on teachers based on these measures, they also were rated as highly dependent by the teachers, with very little overlap between those with secure and anxious histories. Very similar results were obtained in a series of summer camps when the children were 10 years old.

The capacity for emotional regulation. Another clear hypothesis from the Bowlby–Ainsworth position is that a history of secure attachment will provide a foundation for emotional regulation. In part, this is based on the critical place of attachment in the regulation of fear,

and the balance between wariness, exploration, and attachment (Bischof, 1975). We elaborated this idea in a number of early papers on attachment as an organizational construct (e.g., Sroufe, 1979; Sroufe & Waters, 1977; Sroufe, Waters, & Matas, 1974). In our work on emotional development, attachment was explicitly defined as "the dyadic regulation of emotion" (Sroufe, 1996, p. 172). Further, drawing on the conceptual framework of Sander (1975), we elaborated the position that this dyadic regulation of emotion was the prototype for later individual regulation (Sroufe, 1989). Another feature of Bowlby's theory pertinent to this issue is his idea that working models of other and self are complementary; that is, as one becomes confident in the caregiver's capacity to provide regulatory assistance, one also gains confidence in one's own capacities for regulation. Confidence in one's capacity to remain organized, even in the face of high arousal, and the literal entraining of regulatory capacities in dyadic attachment relationships, together underlie the growth of emotional regulation.

We obtained ample data in support of this general hypothesis, as well as in support of a variety of specific manifestations of this capacity. Our preschool and summer camp data, where very detailed measures were available, again provided the strongest evidence. Based on teacher or counselor ratings and Q-sort descriptions of the children, for example, those with secure histories were consistently rated as more self-confident, higher on self-esteem, and more "ego-resilient" than those with either histories of resistant or avoidant attachment. The ego-resiliency measure is specifically a measure of regulation. Being high on this construct reflects the capacity to flexibly adjust expression of feelings and impulses to suit situational requirements; that is, to be exuberant on the playground but contained and attentive during classroom structured activities. Those with secure histories were even significantly higher on specific features, such as "flexible, able to bounce back after stress or difficulty" and "curious and exploring," and lower on items such as "falls to pieces under stress," "inhibited and constricted," and "becomes anxious when the environment is unpredictable" (Sroufe et al., 2005a, p. 73; see also Chapter 7).

These differences based on behavioral ratings were confirmed by detailed behavioral observations (Erez, 1987; Sroufe, Schork, Motti, Lawroski, & LaFreniere, 1984; see also Sroufe et al., 2005a). Using child-sampling methodology, we collected voluminous data on social encounters with peers in the preschool classroom and on the playground. We were able to document the greater frequency of positive affective expression of those with secure histories when they initiated a contact with a peer or responded to a peer initiation, and the way they used positive affect to sustain and build interactions, all in stark contrast to those with anxious attachment histories. They also were significantly higher on specific indicators such as "shows exuberance, lights up" and "has a lot of fun." Similarly, we documented that those with secure histories less frequently coped with social problems with frustration behavior, aggression, or simply giving up. Their coping strategies, in comparison to those with anxious attachment histories, were characterized by persistence and flexibility. They did not as frequently respond to the overtures of others with negative affect, and, in general, they exhibited less whining, fussing, and frustration behavior across all settings than did those with histories of anxious attachment. Significantly more often than those with anxious histories, the affect of those with secure histories was observed to be appropriate to the situation.

Social competence. According to Bowlby, those with histories of secure attachment will have positive expectations regarding relationships with others, an inclination to be closely involved with others, and the social and emotional capacities that promote social competence. Our work has perhaps been strongest of all with regard to this third of Bowlby's predictions. We have found significant links between secure attachment and general measures of social competence, age by age, from early childhood to adulthood

(Sroufe et al., 2005a). Our competence assessments have utilized a variety of procedures, ranging from direct observation, to peer sociometrics, to teacher and counselor ratings and rankings, to interviews with the young people themselves. Thus, from their expectations and representations of relationships, to their engagement with others and skill in interaction, to their popularity, those with histories of secure attachment exhibit higher social competence than those with histories of avoidant or resistant attachment.

   In addition to these global differences in social competence, those with secure histories were found to be higher than those with avoidant or resistant histories on more specific aspects of competence as well (see Sroufe et al., 2005a, for a review). In both preschool and middle childhood, for example, they were more active participants in the peer group and less frequently isolated. In preschool, they were higher on rated and directly observed measures of empathy and were observed to have deeper, more mutual relationships in an extensive series of play pair observations. In middle childhood, they more frequently had reciprocated, close friendships, abided by the rules of the same-gender peer group (including maintenance of gender boundaries), and coordinated friendships with group functioning; that is, they were able to maintain their close connection with a friend even while participating with other children. In adolescence, those with histories of secure attachment were more effective in the mixed-gender peer group, were observed to participate smoothly in a wider range of social encounters (including those that entailed a degree of emotional vulnerability), and had notable leadership qualities. In a camp study, not only were these teens significantly more frequently elected spokespersons for their small groups in designed assessments, but they were observed to be the young persons most frequently looked to by others at critical junctures in the discussion (Englund, Levy, Hyson, & Sroufe, 2000). They manifested social assurance and a quiet authority. Finally, we have found security of attachment to be related to the emotional tone of adult romantic relationships.

Patterns of adaptation

Bowlby's theory, as well as our own organizational perspective on development, implies more than global differences between those with secure and anxious attachment histories on a variety of outcomes. If the organized patterns of dyadic attachment relationships are the prototypes for later individual organization, then there should be consequences for the patterning and organization of later behavior. Not only should behavior be coherent in terms of its organization with other behavior, it should be predictably related to context, varying in meaningful ways. Further, there should be predictable variations in the patterning of behavior between those with histories of resistant attachment and those with histories of avoidant attachment. We have found substantial evidence in support of this position.

Situational variations. We found that "situations of novelty, high stimulation, object mastery, and cognitive challenge are especially difficult for those with resistant histories" (Sroufe et al., 2005a, p. 137). Thus, those with resistant histories, in comparison to both those with secure and those with avoidant history, were less competent as toddlers in an initial encounter with a peer in a playroom, showed more hesitance and less active exploration of a novel, complex object (a curiosity box), showed less flexibility and effectiveness in a variety of problem solving tasks, and were more often viewed by preschool teachers as helpless, passive, and easily frustrated. When social problems arose they were observed to be less persistent and more often used the coping strategy of leaving the situation than did those with avoidant histories. In stark contrast, those with histories of avoidant attachment were uniquely challenged by situations that called for a degree of interpersonal closeness. Not the

first day of class but later classes, when close friendships were occurring, were most difficult for them. Engaging novel objects or solitary play with Lego$^{\text{TM}}$ was not challenging to them but play that involved close physical or emotional encounters with other children was. They were more frequently viewed by teachers as isolated, asocial, and emotionally insulated.

Patterns of behavior. Both those with avoidant and resistant attachment histories were highly dependent on preschool teachers or middle childhood summer camp counselors, but they showed this dependency in different ways. For example, those with resistant histories were much more direct in eliciting contact from their preschool teachers. They hovered near them, sought assistance in the face of the most minimal challenges, and, in general, ''wore their hearts on their sleeves.'' ''Whenever children in the resistant group were upset, disappointed, or anxious, all of which happened easily and often, they went directly to a teacher'' (Sroufe et al., 2005a, p. 138). In turn, based upon independent analysis of videotaped records, their teachers were rated as showing them more nurturance and more tolerance of violating classroom rules. In other words, they saw them as more needy and treated them as less mature than other 5-year-olds. Those with avoidant histories, in contrast, sought contact much more obliquely. They explicitly did not seek out teachers when upset or disappointed, but rather during quiet times, when they would unobtrusively and indirectly draw close. Teachers were not especially nurturing toward them or tolerant of their misbehavior, but they had low expectations concerning their compliance and were controlling of them, and in contrast to their treatment of the resistant cases, they were at times even angry with them. Still, teachers rated both children with avoidant and resistant histories as highly dependent.

These differences in manner of expression but not amount of dependency were also seen in our middle childhood summer camps. There was a great deal of contact between counselors and children from each of these groups but the contact was much more often initiated by the children in the case of those with resistant histories and by the counselors for those with avoidant histories. For only one category of counselor behavior was this trend reversed, namely ''support giving.'' Thus, again, ministrations by adults were more often instructive and controlling for those with avoidant histories, more often nurturing for those with resistant histories, but both groups ultimately had much more contact with counselors than did those with secure histories. Children with secure histories, although having very positive relationships with teachers and counselors, were very occupied in the world of peers.

There also were differences in the profiles of peer problems shown by those with avoidant and resistant histories. Those with avoidant histories often were self-isolating, not initiating much in the way of contact with peers. In our summer camps, they were not likely to be involved in friendships and when they were the relationship was characterized by exclusivity and avoidance of contact with other children (Shulman, Elicker, & Sroufe, 1994). In stark contrast, those with resistant histories often were oriented toward peers, but ineffective in their relationships. They would frequently hover near the peer group as onlookers. Their immaturity and quickness to become frustrated were handicapping conditions in their efforts to sustain interactions. Then, in middle childhood, they had difficulty coordinating friendship maintenance with peer group functioning. They could do one or the other to some extent, but the complexity of this combined social task was beyond them. We will further discuss the distinctiveness of the consequences of avoidant and resistant attachment in the section on psychopathology below.

Attachment and psychopathology

In terms of the discipline of developmental psychopathology, patterns of anxious attachment in infancy are viewed as potential risk factors for later disturbance; that is, they are not viewed as

pathological in themselves or as inevitably leading to pathology but as conditions that increment the probability of disturbance compared to the general population. Likewise, a history of secure attachment is not viewed as a guarantee of healthy functioning but as a "promotive" (Sameroff, 2000, p. 35) or protective factor with regard to pathology. For example, by instilling positive expectations concerning self and others, and by providing a platform for establishing successful close relationships and a viable social support network, early secure attachment promotes strength in the face of challenges and resilience following periods of trouble. Similarly, by entraining flexible patterns of arousal and emotional regulation, histories of secure attachment may make individuals less vulnerable to the consequences of stress. All of this is consistent with Bowlby's views on the role of early attachment in psychopathology and his insistence that developmental outcomes were dependent on the entire history of experience, as well as current circumstances, not just early care.

We have again found ample evidence in support of these propositions (Sroufe et al., 2005a). Of course it is the case that in a risk sample, such as ours, many of those who as infants had secure attachments nonetheless showed behavior problems in childhood and ultimately qualified for some form of psychiatric diagnosis by late adolescence. Still, significantly fewer of these participants had problems at any given age than did those with resistant or avoidant histories or, especially, those with histories of disorganized attachment. More noteworthy, when groups of children whose families were experiencing high stress were formed in middle childhood, one high-stress group made up of children having histories of secure attachment and one high-stress group made up of those with anxious histories, those with secure histories had dramatically fewer behavior problems. Thus, indeed, a history of secure attachment moderated the impact of stress on disturbance. Likewise, when children showing troubled behavior, either in the preschool years or middle childhood, were followed into the next period, their degree of recovery was forecast by a history of secure attachment and nurturing in the first 2 years (Sroufe, Carlson, Levy, & Egeland, 1999; Sroufe, Egeland, & Kreutzer, 1990). Those with anxious histories continued to show high levels of problems in the next period, while those with secure histories became indistinguishable from the larger sample.

In parallel fashion, most of those with histories of anxious attachment do *not* have serious behavior problems or qualify for psychiatric diagnoses. Avoidant and resistant patterns of infant attachment are only moderate risks for disturbance. Still, as with other risk factors, they do statistically increment the probability of disturbance in comparison to those with secure history. Moreover, when combined with other measures of parenting across childhood and, especially, when combined with a number of other risk factors, probability of disturbance is notably increased (see Sroufe et al., 2005a, Chapter 12). The one exception to this pattern of very moderate risk concerns the consequences of disorganized attachment. Disorganized attachment, in infancy, is by itself a quite strong predictor of later disturbance. For example, the correlation between degree of disorganization in infancy and number and severity of psychiatric symptoms at age 17½, based on diagnostic interviews, approaches .40. While this leaves a great deal of unexplained variance, this relation is far stronger than for any other measure from the infancy period. It rivals the prediction from behavior problems already manifest in early childhood.

There also has been some specificity in the relations between various patterns of anxious attachment and later disturbance, and these relations have been theoretically meaningful. For example, avoidant attachment history has tended to be more related to conduct problems. This seems reasonable, given the interpersonal alienation and anger that derives from a history of emotional unavailability and rejection that characterized their early care. In contrast, resistant history is most strongly related to anxiety disturbances that, at age 17½,

avoidant attachment was not. In fact when we examined anxiety disorders and "all other disorders," resistant attachment was related only to the former and no more than secure attachment to the latter. Based on Main's concept of conditional strategies (e.g., Main & Hesse, 1990), we find this specificity to be extraordinarily compelling. In the face of an only inconsistently responsive caregiver, infants in the resistant group adopt a strategy of hyper-vigilance and hyper-attentiveness to the caregiver, emitting attachment behaviors strongly and frequently, even with mild external provocation. Such a stance may be adaptive in insuring contact with the caregiver when there is a genuine threat, but a price is paid for such chronic wariness and vigilance. Interestingly, both avoidant and resistant attachment were moderately related to depression (Duggal, Carlson, Sroufe, & Egeland, 2001). We have speculated that two distinctive pathways may be involved, one based on alienation and hopelessness and the other based on anxiety and helplessness, the cardinal features of depression (Sroufe et al., 2005a).

We also had some specific predictions regarding disorganized attachment. In particular, based on ample theory (Liotti, 1992; Main & Hesse, 1990), we predicted that disorganized attachment in infancy would predict later dissociation. This prediction was strongly borne out, both in terms of checklists in middle adolescence and based on scores on the Dissociative Experiences Scale (Carlson & Putnam, 1993) at age 19 (Carlson, 1998; Ogawa, Sroufe, Weinfield, Carlson, & Egeland, 1997; see Sroufe et al. 2005a for further details). In infancy, in the face of confusing or frightening caregivers, these children had been confronted with the irresolvable conflict of striving to flee from the source of fear and yet flee to the source of fear—the caregiver. Collapse of strategies, rapid state changes, and other proto-dissociative mechanisms were all that were available to them. Thus, a prototype of psychic collapse or segregating experience was established. Disorganized attachment also predicts conduct disorder, we believe, because of the dissociative tendencies and attendant problems with impulse control.

As our study now moves into adulthood proper, we are working toward a long-term goal of examining the link between early attachment history and personality disorders. According to Bowlby, malevolent attachment experiences, especially a contradiction between one's own experiences and what one is told has been the case, can lead to a constellation of factors, including "chronic distrust of people, inhibition of their curiosity, distrust of their own senses, and a tendency to find everything unreal" (1988, p. 103). These are hallmarks of major personality disorders, including borderline personality. It is our position that serious personality disorders, on those rare occasions when they do occur, will be the legacy of disorganized attachment, at times in conjunction with avoidant attachment (and thus a combination of alienation and a tendency toward dissociation). We do not expect serious disorder to be at all related to anxious/resistant attachment. Findings of such a link based on the Adult Attachment Interview have been retrospective; seriously disturbed individuals present incoherent and preoccupied accounts of their childhoods. In our own prospective study we find no such link, and, in fact, preoccupied status on the AAI is linked only to anxiety disorders, congruous with our findings for resistant attachment, presented above (Sampson & Carlson, 2005).

We do not yet have the data on full-blown personality disorders in adulthood, but we have been able to carry out an intermediate step (Yates, 2004). We view serious self-injurious behavior (SIB) as a likely precursor of such disorders. Our data show that such behavior (e.g., cutting, burning) in early adulthood was strongly related to a history of disorganized attachment, maltreatment (especially sexual abuse), and, ultimately dissociation. These factors remained significant when other potential causal factors were controlled (see Sroufe et al., 2005a, for further details).

Attachment and the developmental process

In our recent book, we have detailed the place of attachment within an integrative, systemic view of development (Sroufe et al., 2005a). Three features of this viewpoint will be briefly outlined here: (a) non-linearity, (b) multiple influences, and (c) complexity of process.

Non-linearity of attachment–outcome linkages

In the pathways view outlined by Bowlby (see, especially, 1973), early variations in attachment are viewed as initiating conditions, launching individuals on pathways that are only probabilistically related to outcomes. Moreover, attention is drawn not just to the early attachment patterns but also to a myriad of factors that either support progress along the initial pathway or promote deflections from the initial course. Such change can occur all along the way, yet it is also proposed that change becomes more difficult the longer the pathway in question has been followed. Thus, in this view, it is the cumulative history (as well as current challenges and supports), and not early attachments alone that account for any observed outcome. In our work we repeatedly documented that factors such as changes in social support and life stress were associated with change (Sroufe et al., 2005a).

Another important feature of Bowlby's model is its implications for continuity as well as for change. Since behavior is always a function of the entire history, change, even when substantial, does not mean that early experience and early adaptation is erased. Bowlby (1973) described development as ''homeorhetic''; that is, there is a tendency for individuals to return to trajectories of development following perturbations. We were able to document the tendency of early attachment patterns to be preserved following change. First, we found that even following clear and demonstrable change, early patterns could still be discerned in certain settings or in certain ways. For example, we asked our preschool teachers, who were completely blind to information about the children's histories, to review the entire list of children that they had described as having serious struggles. They then were asked in which of these children they could nonetheless observe a core of inner self-worth, an indication that let teachers predict that maybe they could get better. Remarkably, the children they selected were significantly more likely to have been securely attached as infants, even though the teachers had rated them as comparably low on competence in the preschool.

Second, as we presented earlier, we were also able to make actual prospective predictions regarding which children would recover from a period of behavior problems, based on their histories of attachment security. As we will discuss in the next section, this led us to a particular view on the concept of resilience. Some children do have the capacity to recover following a period of trouble, one definition of resilience, but this capacity is based at least in part in history and is not a magical characteristic simply inherent in the child.

Multiple influences

While attachment history was clearly and reliably related to a host of meaningful outcomes in our work, it was also the case that predictions routinely were dramatically improved when attachment was combined with other predictors (Sroufe et al., 2005a). This included other aspects of parenting that lay outside of the attachment domain and that we measured beyond infancy. In addition to serving as a secure base for exploration, a haven of safety, and as a source of reassurance for a distressed child (the hallmarks of the attachment function), parents do many other things for children. For example, parents ''provide stimulation for

the child that may or may not be appropriately modulated. They provide guidance, limits, and interactive support for problem solving. In addition, they support the child's competence in the broader world, for example by making possible and supporting social contacts outside the home'' (Sroufe et al., 2005b, p. 51). In our work, we created an early care composite that included sensitive caregiving at 6 months and attachment security at 12 and 18 months, but also some of these other aspects of parental support at 24, 30, and 42 months. With great regularity, this care composite was a stronger predictor of later competence or problems than was attachment alone. Moreover, for some areas of functioning (e.g., competence at school), other aspects of parental care out performed attachment as predictors. When it came to predicting functioning in adolescence, later assessments of parental supports for emerging autonomy also were important. Attachment clearly is important, but other aspects of care are significant. Including them in our developmental models does not trivialize attachment.

Similarly, parents are not the only important social influences on development. We have shown both sibling and peer relationships to be important (Sroufe et al., 2005a). Our peer relationship measures have been hugely important in predicting certain outcomes, such as, for example, competence in romantic relationships and in the work arena (Collins & van Dulmen, in press). Again, when attachment and peer measures are combined, they are with notable exceptions (see ''Complexity'' section) more powerful than when they are treated separately, for outcomes ranging from school performance to behavior problems and to social competence. In combination, attachment, other parenting variables, and peer variables are at times extraordinarily strong predictors, with multiple correlations often exceeding .50 or .60, even over substantial periods of time.

Finally, surrounding context too must be considered. When measures of family stress and social support are added to our regression analyses, they routinely add to parenting and peer measures in predicting outcomes. Also, as we mentioned earlier, there is an important role for changing family stresses and supports in altering patterns of adaptation. For example, increases in social support for the primary caregiver was the strongest factor in predicting improved functioning in kindergarten for those who had been anxiously attached as infants. Likewise, one of the strongest predictors of recovery from a period of troubled behavior in the preschool or middle childhood periods and later functioning was differential changes in life stress during the intervening years. When changes in life stress were combined with a history of secure infant attachment, this accounted for the clear majority of variance in recovery (Sroufe et al., 1990; Sroufe et al., 1999). It is our view that, as in accounting for continuity in functioning, accounting for change entails considering both early history and ongoing supports and challenges. Children who recover from a period of adversity or maladaptation have either a solid foundation on which they can rely, increased supports and decreased challenges, or, more often, both.

Complexity

Over the years of this study, our focus has shifted from questions concerning whether infant attachment variations predict later important outcomes, and even from questions concerning the combined power of attachment and other variables, to questions about how such linkages occur; that is, to questions about the developmental process itself. We have thought about this process in two complementary ways, and we have generated substantial evidence for both. The first, springing from the idea of initiating conditions, is that certain ''structures'' are created which, while changeable, nonetheless are a force in subsequent reactions to experience. The second way we have thought about linkages is in

terms of intermediate (and mediating) outcomes; for example, that early attachment security sets up positive functioning in a subsequent period or subsequent arena that then itself supports further growth.

The structures that may be created through early attachment experiences range across levels from excitatory and inhibitory systems of the brain, to established patterns of affect regulation, to frameworks for coordinated interpersonal behavior, and to attitudes and expectations regarding the self, others, and relationships (e.g., Kraemer, 1992; Sroufe et al., 2005a). In outlining some of our outcome data earlier, we illustrated the consequences for some of these linkages (e.g., emotional regulation). We also obtained a great deal of data at the level of representation. We assessed representations of self and others at multiple ages and in multiple ways, from play to drawings and other projectives to narratives (Carlson, Sroufe, & Egeland, 2004; Sroufe et al., 2005a). We found that, indeed, attachment variations were consistently related to these later measures of representation and that, in each case, representation measures were related to contemporary and later measures of behavioral functioning. We will comment more on the interplay of representation and behavior below.

As implied in the preceding section, intermediate outcomes of early attachment include later parenting itself and peer relationships. For example, patterns of inconsistent care lead to resistant attachment and subsequently to a pattern of toddler adaptation characterized by frustration, whining, and fretful non-compliance. Such a child, because of this, will need more clear, firm, and *consistent* limits than even most 2-year olds, but this is precisely what is difficult for caregivers in this group to provide. The problem worsens. Subsequent immaturity and affect dysregulation in preschool thus is properly seen as the outcome of this cumulative process. In some cases in our analyses, once care at a subsequent age is considered, attachment is no longer a significant predictor (Sroufe et al., 2005b). Similarly, attachment history provides the foundation for variations in early peer relationships, because of variations in expectations, problems solving skills, and affect regulation capacities. There is no question that secure attachment is a critical platform for engaging the world of peers. Still, once successfully engaged in the peer group, many capacities are acquired in that arena vital for later social relationships. Mastering the frustrations of symmetrical relationships and learning to negotiate and resolve conflicts with equals really requires the world of peers. Not surprisingly, therefore, we find that aspects of smooth interaction in adult social relationships often are well predicted by earlier peer competence and, at times, are only indirectly related to attachment.

The complexity of this developmental process can be great indeed. For one thing, depending on the outcome in question, there is great variety in the nature of linkages obtained. Sometimes there is mediation, and attachment effects are no longer significant. Sometimes attachment effects remain significant even when a host of intermediate variables are included. This seems to be especially true when outcomes concern issues of interpersonal trust or the emotional tone of relationships (Sroufe et al., 2005b). For example, in our observation-based measure of hostility in romantic relationships in early adulthood we found substantial prediction from attachment history. (Disorganized attachment alone correlated .42, a remarkable effect across 2 decades and numerous developmental periods.) Peer competence in middle childhood also predicted this outcome, but this effect did not mediate attachment in this case; both independently predicted hostility. In contrast, in the case of a composite positive parenting variable from our laboratory-based observations of 13-year-olds, there were direct effects of both attachment and 13-year parenting *and* an indirect effect of attachment through the 13-year parenting variable. We uncovered repeated evidence for each of these scenarios.

The final complexity arises when we consider multiple time points. Not only does representation mediate the effect of prior experience on later adaptation, later experience, and adaptation impact representation. Later representation may be predicted by experience at a given time with representation established by that time controlled (Carlson et al., 2004). For example, attachment history predicts self- and caregiver-representations in drawings in early elementary school, and these together predict peer competence at that age. But early elementary peer competence accounts for changes in representation assessed in the sixth grade, and so on. The developmental process is characterized by the mutual interplay of experience and representation of experience over time.

Conclusion

Variations in infant–caregiver attachment do not relate well to every outcome, nor do they relate inexorably to any outcome whatsoever. They are related to outcomes only probabilistically and only in the context of complex developmental systems and processes. Still, the importance of attachment is not trivialized by such considerations. Within a systemic, organismic view of development, attachment is important precisely because of its place in the initiation of these complex processes. It is an organizing core in development that is always integrated with later experience and never lost. While it is not proper to think of attachment variations as directly causing certain outcomes, and while early attachment has no privileged causal status, it is nonetheless the case that nothing can be assessed in infancy that is more important. Infant attachment is critical, both because of its place in initiating pathways of development and because of its connection with so many critical developmental functions—social relatedness, arousal modulation, emotional regulation, and curiosity, to name just a few. Attachment experiences remain, even in this complex view, vital in the formation of the person.

Acknowledgement

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