CHAPTER 10

Predictability of Attachment Behavior and Representational Processes at 1, 6, and 19 Years of Age

The Berkeley Longitudinal Study

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This chapter summarizes the current findings from the Berkeley longitudinal study of attachment. Here we describe what we have learned to date regarding the attachment-related trajectories taken by 42 participants in our sample, and report striking overall predictability of behavioral, representational, and linguistic processes from infancy to 6 years, and then to 19 years of age. We trace these developments separately via initial infant ‘attachment category’ (“secure,” “insecure-avoidant,” or “insecure-disorganized”\(^1\); see category descriptors below), and when possible, we refer as well to the continuous scales associated with the Strange Situation and the Adult Attachment Interview (AAI). At the time of this writing, a handful of cases have yet to be analyzed, and therefore only the simplest of tests have been conducted, and no exact statistics can yet be given.

Our longitudinal study began with the assessment of attachment in infancy, utilizing Mary Ainsworth’s Strange Situation procedure. Although laboratory-based, this procedure had its origins in Ainsworth’s early adherence to the traditions of ethology, which focus upon the behavior of organisms in their natural environments. Thus, well prior to devising the Strange
Situation procedure, Ainsworth undertook extensive observations of both Ugandan and American infant–mother dyads in the home. As her work progressed, Ainsworth drew increasingly upon her intimate understanding of attachment theory as a conceptual backdrop for formulating and testing hypotheses. For example, she was well aware of John Bowlby’s (1969/1982) point that for primate infants, maintaining proximity to the attachment figure (usually, but not necessarily, the biological parent) in situations of danger is critical for survival. Moreover, Bowlby had proposed that for infant primates there are “natural clues to danger”—including, for example, unfamiliar settings, darkness, separation from the attachment figure, and (often) the approach of strangers. Propensities to seek the attachment figure (the infant’s “haven of safety”) may be aroused by any of these clues, but are especially expectable when more than one is present (Bowlby, 1969/1982).

Ainsworth devised the Strange Situation after she completed her extensive home observations of infant–mother interactions in Baltimore across the first year of life. The Strange Situation is a naturalistic procedure intended to permit the observation of attachment (and its complement, exploratory behavior) in the face of singular and combined natural clues to danger. Here, an infant and an attachment figure are observed as they respond to an unfamiliar setting, to the approach of a stranger, and to two separations and reunions between the infant and the attachment figure (in Ainsworth’s studies and most others, the infant’s mother). Somewhat surprisingly, Ainsworth found that infant responses to separation and reunion in this procedure fell into three distinct, coherently organized patterns of attachment (“secure,” “insecure-avoidant,” and “insecure-ambivalent”—later termed the “organized” patterns of attachment; see Main, 1990, and below). These three central behavioral responses to the Strange Situation procedure were detailed by Ainsworth for identification by later researchers (Ainsworth, Blehar, Waters, & Wall, 1978). Ainsworth regarded this set of three categories as exhaustive, and—based on her previous home observations—as originating in differences in maternal sensitivity and responsiveness to infant signals and communications. Specifically, secure infants had mothers who were judged sensitively responsive on her 9-point rating scales, while mothers of insecure-avoidant and insecure-ambivalent infants were markedly less sensitive. However, in none of Ainsworth’s original observations was the possibility considered that some mothers, whether sensitive or insensitive, could also be frightening.

Later—in conjunction with the discovery of a fourth Strange Situation attachment category, “insecure-disorganized/disoriented” (or “D”) (Main & Solomon, 1990)—we began to extend attachment theory to include the potential import of infant exposure to anomalous fear-arousing parental behaviors, instead of or in addition to the external fear-arousing conditions.
examined by Bowlby (Main & Hesse, 1990). We proposed that fear of the parent could account for many instances of disorganized behavior, since the infant’s natural haven of safety will have simultaneously and paradoxically become the source of its alarm (Hesse & Main, 1999, 2000).

Aided by this expanded outlook, and beginning with the Strange Situation procedure as our “ethological” or “naturalistic” base, we then observed the continuing development of our sample in other contexts, using both behavioral and representational methods we had designed for assessing attachment at 6 years and in later life. We interpreted the prediction from early Strange Situation responses found in our sample as the product of each participant’s early—and, in our stable, low-risk sample, quite likely enduring—experiences involving the primary attachment figure(s). Later, we suggested that these early experiences may initially operate by influencing infant attentional processes related to attachment (Main, 1990, 1999)—yielding, respectively, unrestricted or flexible attention (sensitive responsive parenting); inflexibility of attention (insensitive but not frightening parenting, whether involving rejection or unpredictable responsiveness); and collapse of attention caused by excesses of fear or stress (frightening parenting). At present, our study has progressed to 18 years following the Strange Situation, at which time an attachment-focused life history interview (the AAI; see below) has been conducted with each former infant (George, Kaplan, & Main, 1984, 1985, 1996). This interview is intended by means of its structure to “surprise the unconscious” and, via examination of exact language usages, to elucidate critical aspects of mind (Main & Goldwyn, 1984–1998; Main, Goldwyn, & Hesse, 2003). In all four U.S. samples examined to date, individual differences in coherence during this interview have been found to be systematically related to early attachment status with the mother.

Throughout this chapter, then, we refer to the import of recurring interactions as a factor in constructing social mind. A consideration of the role of early interactions in the development of mind is far from new; indeed, Grossmann (1995) has drawn attention to Plato’s (see Plato, 1953) view that character is shaped by the caregiver’s responses to the infant within the first 3 years of life. The import of interaction in the development of social mind is also underscored in Stern’s (1985) RIGS theory (“representations of interactions that have been generalized”); script theory (see Bretherton, 1985); and the recent focus upon the import of implicit (procedural) memories, especially when these are constructed early and relate to attachment (see, e.g., Amini, Lewis, Lannon, & Louie, 1996).

This presentation is intended for both those new to and those familiar with the field. Persons already familiar with attachment research and procedures (e.g., the Strange Situation and its background, early British work concerning parent–child separations, and the AAI) can of course skip
lightly over these parts. Given the length and complexity of this chapter, however, we suggest that individuals who are busy or less familiar with this topic divide their reading across several time periods related to its three central corresponding parts (secure attachment, pp. 261–273; avoidant attachment, pp. 273–279; and disorganized attachment, pp. 279–288).

PRELUDE

Together with The Guilford Press, the editors have requested that the first authors of presentations in this volume provide personal biographical discussions of their backgrounds with respect to their eventual decisions to undertake their particular studies. Although all three authors have contributed equally to this presentation, the Berkeley study was initiated by Mary Main. This prelude is therefore written by Main in the first person.

I completed my secondary education at a Quaker school in Philadelphia (Friends’ Select), where my best subjects were physics and chemistry, while in contrast my favorite subjects were literature, music, and art. Unwilling to narrow my interests to a single “major” as most universities require, I next attended St. John’s College in Annapolis, Maryland, which uses no textbooks, instead providing its students only with original works. St. John’s requires each student to undertake 4 years of mathematics; 4 years of literature and philosophy (philosophy was much admired by my parents, who had introduced me to Plato, Kant, and several Eastern philosophies by age 10); 2 years of languages; and 4 years of the natural or “hard” sciences (which continued to be my best subjects). Because I had married one of my professors, the late Alvin Nye Main (whose doctoral training at UCLA had been in linguistic philosophy, a branch of philosophy that—short of Wittgenstein for his work and character, and Moore for his character—he did not much admire), I needed to find a graduate school nearby. After considering applying to the Peabody Conservatory to study piano, and The Johns Hopkins University for the graduate study of history, I read Noam Chomsky’s work and—fascinated and persuaded by his assertions regarding the implications of the often unique, creative, and yet grammatical nature of many speakers’ sentences—applied to Hopkins (whose doctoral program relied upon the apprentice system) to study psycholinguistics with James Deese. However, I was accepted instead by Mary Ainsworth (then at Stanford University for her sabbatical) as her prospective student in the field of infant–mother attachment.

I was doubtful about the advisability of taking up Ainsworth’s offer, since my interest in linguistics had been sincere. Just as some children are drawn to music or mathematics in their earliest years, I had been drawn
from the age of 2 to language in the form of natural speech and speech usages, and wrote down some especially interesting sentences I had heard as soon as I was able. I had, however, found verbal metaphors torturous, since they frequently violated my tentatively developing sense of what a particular word actually indicated, as well as of what to expect in terms of space–time relations and causality. As I often ran about in circles of now-humorous linguistic complaint (“I am a little girl! I know what pills are, and a little girl cannot also be a pill!”), my parents learned to calm me with the phrase “It’s just a ‘spression” when they were using metaphors. This phrase was intended to indicate that they were using language in ways set apart from those I understood at the time, and hence that I need not presently be worried about them.

Ainsworth’s offer for me to enter Hopkins as a student of attachment continued to trouble me, and I complained that babies and individual differences in parent–child relationships had no connection to language. My philosopher husband argued, however, that a given field can be approached from many angles, and that learning to recognize variations in emotional relationships in children too young to speak could still eventually bring me back to language—perhaps enriched by this seemingly unpromising vantage point. Less than 10 years later, this had become true, with the advent in our laboratory of a method for scoring and classifying exact speech usages in life history transcripts (the AAI; see below) and the power of this methodology to predict the quality of the infant’s highly emotional attachment to the speaker.

Johns Hopkins did not permit specialization until its students had spent 2 years establishing a broad initial knowledge base in psychology, ranging from personality to vision and psychophysiology. My favorite three books, each read repeatedly, were Hinde’s (1966) Animal Behaviour, Underwood’s (1966) Experimental Psychology, and Bowlby’s (1969/1982) Attachment. As a professor, Mary Ainsworth also encouraged breadth, and I took several extracurricular courses in evolution. At the time I entered Hopkins, Ainsworth had just developed the Strange Situation procedure. To satisfy her that I could use it in my own work, she required that I reach a high level of agreement with her across 100 transcribed procedures (videotape had yet to be utilized) in her three major classifications and eight subclassifications. I did, and was then ready to undertake my doctoral dissertation.

For my dissertation at Johns Hopkins (Main, 1973), I watched 50 children seen in the Strange Situation at 12 months as they responded to opportunities for both free and structured play at 21 months. The toddlers were observed in their mothers’ presence in a playroom that my friend Everett Waters and I had made very comfortable and attractive (besides
filming all the play sessions, Everett cut and re-sewed the carpet to better fit the playroom. I found that infants secure with their mothers were the most intensely and lengthily engaged in exploration, and showed the most “game-like” spirit when playing with another close friend, Inge Bretherton.

I also presented each toddler with what are now called “story stems.” Here Inge was asked to pick up a toy dog and, barking and growling vivaciously, to make it approach a small baby doll placed in a toy carriage. She was then to return to human status and cry out, “Oh, don’t let the doggy bite the baby!” Although my findings were in the predicted directions (dogs in the grasp of secure infants protected the baby, while dogs in the grasp of some avoidant infants attacked), they seemed too minor to publish.

Looking at speech, Everett and I could see how intensely many of these 21-month-olds seemed to believe that their incomprehensible utterances were understandable language (e.g., one child said, with incisive gestures and a sincere expression, “Ho-lee-gah-ho-lee-ho-gey—hokee!!”). I found no relation between security of attachment and overall level of either early language development or symbolic play. We did find, however, that children who were insecure with their mothers were as fascinating, intelligent, and likable to us as were secure children. This was exemplified by our affection for the highly talkative but insecure toddler just mentioned, who greatly hoped to be comprehended, but was not.

Using Ainsworth’s three-part classification system (secure, avoidant, and resistant/ambivalent), I found that at least five infants in my sample could not be classified. These were informally called “A-C” or “avoidant/resistant” infants; however, following a practice Ainsworth had already established for a single earlier case, she and I force-classified them into what seemed to us to be the best-fitting category. I had visited most of the mothers in my sample earlier in their homes to discuss the forthcoming Strange Situation procedure, and I knew that at least three of the five mothers of the unclassifiable infants had behaved most peculiarly with their offspring: One—frighteningly, to me—had treated her toddler as an animal. Observing especially those five as well as some other infants, and greatly influenced by Hinde’s (1966) Animal Behaviour, I counted the occurrences of any anomalous-appearing conflict behaviors in the play session. By 1979, in a scale developed for use with similar laboratory-based free-play observations in Regensburg, I would come to call these behaviors “disorganized/disordered” (later “disorganized/disoriented”; Main & Solomon, 1990).

A related and influential observation took place in my office as I discussed the forthcoming play session with the mother of an avoidant infant, during a typically sudden and violent Baltimore thunderstorm. A very close clap of thunder startled all of us, and the toddler ran unpredictably to me rather than to her mother, burying her head in my lap. This provided my
first strong illustration that infant insecurity can be associated with disorientation under stress.

I completed my graduate work in 4 years, and presented my findings very soon afterward in Germany at Klaus Grossmann’s invitation (see Main, 1977). From Hopkins I went directly to take a faculty position at Berkeley, where I spent my first 2 years trying to replicate many of the findings uncovered earlier within Ainsworth’s narrative records. Replicability is one of the principles distinguishing the “hard” sciences (Hinde, 1983), and from that time forward, publication of my findings would often await one (and sometimes two), replications.

At Berkeley, many of the themes I have mentioned above would be repeated. First, via the AAI developed with Carol George and Nancy Kaplan (George et al., 1984, 1985, 1996) I would at last return to my original interest in spoken language usage or discourse. More specifically, the rules that Ruth Goldwyn and I (1984) developed for identifying the speech characteristics of the parents of secure, insecure-ambivalent, and insecure-avoidant infants would several years later be partly expressed in terms of adherence to as opposed to violations of Grice’s maxims for achieving cooperative, rational discourse (Grice, 1975, 1989).

I would also have the opportunity to study individual differences in the “creativity” of speakers’ sentences, an interest derived from my early reading of Chomsky. Although Chomsky had been referring to our universal human capacity to speak sentences never before said or heard, this now seems to me to appear most often in the fresh, yet coherent, sentences seen most frequently in the parents of secure infants. Second, I would expand my interest in children’s responses to story stems, by acting as Nancy Kaplan’s dissertation advisor in her work with transcripts of 6-year-olds’ responses to questions concerning pictured child–parent separations (Kaplan, 1987). Third, I would become highly focused on the problem of “unclassifiable” or “A-C” infants. The frightening behavior originally observed in the Baltimore homes of a few such infants (now “disorganized” or “D” infants) would turn out to be the distinguishing feature of the mothers of D infants in several samples studied in later years (Hesse & Main, 2000). And I would continue to believe, with Mary Ainsworth, that a great deal can be revealed even in very short intervals—as shown in a 6-year-old’s reunion behavior towards a parent observed for 3–5 minutes following an hour-long separation (Main & Cassidy, 1988; see below).

My interests in animal behavior and evolutionary theory, encouraged early by Mary Ainsworth and John Bowlby, would continue as well. These were extended and amplified during a year-long visit in 1977 to the Center for Interdisciplinary Research in Bielefeld, Germany, at the invitation of the Grossmanns. There I spent much time learning from various biologists,
evolutionary theorists, and ethologists, including especially John Crook, Richard Dawkins, and Robert Hinde. These new friends had a strong impact upon my thinking by making me aware of (1) the import of the ecology of the immediate environment in producing differing “conditional strategies” for reproductive success (e.g., Crook & Gartlan, 1966; Trivers, 1974); (2) the rigorous yet changing nature of Darwinian theory following the “evolutionary synthesis” with genetics in the 1930s, and the emergence of kin selection theory (e.g., Dawkins, 1976/1989); and (3) theories of motivation and, relatedly, the analysis of the outcomes of conflicting behavioral propensities (e.g., Hinde, 1966).

ATTACHMENT THEORY

This chapter now returns to triple authorship, and will shortly begin to focus upon our longitudinal findings regarding the sequelae to early individual differences in attachment. However, because this work is written for those new to the field as well as others more familiar with it, we start with a brief review of Bowlby’s (1969/1982) “ethological–evolutionary” theory of attachment, which focuses upon the universals of attachment (for a complete overview, see Hinde, Chapter 1, this volume). We then discuss the two pathways that have generally been considered most plausible by those attempting to account for the origins of individual differences in patterns of attachment. Although these pathways can ultimately interact, here we will put the matter simply—that is, as taking their origins either (1) via “heritable” genetic differences between individuals (an aspect of “behavior genetics”), or (2) via “nonheritable” types of conditional strategies (alternatively, “contingent decision rules”; see Daly, 1996) of the type utilized when individuals who are equipped with the same behavioral programs respond in systematically differing ways to differing rearing environments.

Bowlby’s Theory of Attachment: A Species-Wide “Behavioral System” and Its Operation

Attachment theory represented a radical departure from previous conceptualizations of the nature of the child’s tie to the mother, and took Bowlby over 30 years to formulate. The most fundamental distinction between Bowlby’s thinking regarding parent–child ties and that of his predecessors was his requirement that his formulations conform to the paradigm of natural selection. This was due to his introduction in the early 1950s to recent developments in the field of ethology. Guided in large part by Robert Hinde (see Bretherton, 1992), Bowlby was taken with the reasoning that species-specific behavior patterns, like species morphology, are the products of
selection pressures that assist in individual survival and ultimately in reproductive success. Eventually, following an extensive review of the human and nonhuman primate literature, Bowlby was led to the conclusion that crying, calling, following, clinging, and other behaviors that become focused on one or two selected caregivers during the first year of life have come over evolutionary time to be virtually universal among primates (including, of course, humans). Because of their species-wide nature, Bowlby ultimately attributed these characteristics to the working of an instinctively guided “attachment behavioral system.”

Bowlby further proposed that the infant primate’s focus upon the attachment figure (usually, but not necessarily, the biological mother) has been rendered all the more emotional and insistent because—due to the fact that many primates are seminomadic—it is inevitably closely intertwined with fear. The substantial distances traveled by most primates means that they cannot establish a fixed location for protection of the young, such as a burrow or den. In contrast to those mammals for whom a special place provides the infant’s haven of safety, then, for the primate infant the attachment figure is the single location that must be sought under conditions of alarm (Bowlby, 1969/1982; Hesse & Main, 1999).

Bowlby suggested that the specific environmental pressure accounting for infant proximity maintenance has been attacks from predators, and that protection from predation has served as the biological or adaptive function leading to the incorporation of attachment behavior into the species-wide repertoire. Because predation is a constant and pervasive danger to primate infants, he maintained that attachment behavior is of equal import to feeding and mating. Later, informed by John Crook (personal communication, 1977), Main (e.g., 1979) suggested that the biological or adaptive functions served by proximity-keeping to caregivers could be broadened to include protection from starvation, unfavorable temperature changes, natural disasters, attacks by conspecifics, and the risk of separation from the troop. This extension was ultimately endorsed by Bowlby (1988), and maintenance of proximity to attachment figures is now believed to serve multiple survival-related functions. And for young primates currently living in the wild, as well as humans living in their “environments of evolutionary adaptedness” (Bowlby, 1969/1982), it is now widely agreed that even brief separations can threaten infant survival in minutes, and certainly within hours (Hinde, 1974; Hrdy, 1999).

Attachment has therefore come to be viewed as the central “external” or “behavioral” mechanism regulating infant safety, and maintenance of proximity to attachment figures is understood to be the sine qua non of primate infant survival (Hinde, 1974; Hrdy, 1999). Of necessity, then, the attachment system must remain continually responsive; hence the infant will at some level continually “track” the physical and psychological acces-
sibility of the primary attachment figure(s), whether or not attachment behavior is explicitly displayed at any given time.

Bowlby’s theory of attachment thus refers to a universal or species-wide characteristic: the genetically channeled propensity for all young, so long as they are given even very minimal environmental input during the earliest years of life, to form a highly emotional bond to at least one older individual and thereafter to seek, monitor, and attempt to maintain proximity to that individual(s). The developing child’s proclivity to learn the language of his or her immediate surroundings—again, so long as even minimal input is available during the earliest years of life—also provides a good example of what is meant by a “universal” or “species-wide” characteristic. Like the proclivity to form an attachment, language acquisition is also considered a matter of population-wide genetics (a term that is used as well, with somewhat different meanings, in other contexts). These in-built, species-wide propensities are often referred to as “behavioral programs” or “behavioral systems” (formerly “instinctive behaviors”; see Hinde, Chapter 1, this volume).

Individual Differences in Attachment-Related Behavior

Since this chapter focuses upon individual differences in attachment and their sequelae, we begin with the following: Attachments are formed virtually universally, and thereafter are expected to arouse propensities to seek proximity to attachment figures in the face of “natural clues to danger.” At the same time, primates have associated propensities to decrease attachment behavior in the service of exploration and play in “safe” conditions, (see especially Grossmann, Grossmann, & Zimmermann, 1999). How then could a substantial minority of infants presented with clues to danger and safety in the Strange Situation violate the outcomes that would be anticipated, given our understanding of this species-wide “behavioral program”?

One example is the insecure-avoidant Strange Situation response, which is exhibited by a substantial minority of infants worldwide. These infants, who show virtually no distress but instead explore throughout the Strange Situation, not only fail to greet their mothers on the mothers’ return but also actively turn away, ignore, and/or move away from them. The attachment behavior of these infants has been repeatedly observed to be rejected by their mothers in the home; however, interestingly, many of these infants show overt distress and anxiety as their mothers move from room to room in this familiar setting. Main (1981) has proposed that in the unfamiliar (hence implicitly far more dangerous) Strange Situation setting, a rejected infant employs an “organized shift of attention” (i.e., active visual, auditory and physical avoidance) to assist with the inhibition of attachment behavior. Main has further proposed that infant avoidance may
have historically led a mother to decrease her attention to, and hence decrease her rejection of, the infant.

In contrast to both secure and avoidant infants, ambivalent infants—a small minority of infants, whose mothers’ responsiveness has been unpredictable—display attachment behavior even long following their mothers’ return to the laboratory room. This is a change in conditions that should normally signal “safety” and hence lead to a return to exploration and play.

In short, neither of these widely observed “insecure” responses to the Strange Situation seen in a substantial minority of infants are in keeping with the general expectation that the attachment behavioral program will inevitably be activated in conditions suggestive of “danger,” while the complementary exploratory behavioral program will be activated under “safe” conditions. And, as regards the fourth Strange Situation category mentioned above, we must also ask why some infants unexpectedly show bouts of disorganized behavior.

Because differences in response to the mother in the Strange Situation in low-risk samples are relatively stable across the early years—and even in high-risk samples are found to be predictive of aspects of social behavior many years later in new settings (see Weinfield, Sroufe, Egeland, & Carlson, 1999)—the question of whether these differences should be attributed primarily to genetic or rather to experiential sources has not infrequently arisen. An example of a “behavior genetics” approach to understanding these differences is the proposal that the specific, heritable genetic makeup of a given individual may place him or her within a subset of species members who differ, say, in being more (or instead, less) fearful than others in new situations. It has thus been suggested by some that heritable or genetically based differences in tendencies to fear new situations could account for the differing response patterns observed. In this view, infants who seek their mothers on the mothers’ return to an unfamiliar setting may be carrying genes that create a lower fear threshold for new situations (especially ambivalent infants), and those who fail to approach (avoidant infants) may have a heritably (i.e., genetically based) high fear threshold. This explanation, however, has yet to be supported by the data (see Stevenson-Hinde, Chapter 8, this volume).

In fact, following a series of earlier data-based arguments for an environmental origin to individual differences in attachment patterns (see Main & Weston, 1981; Sroufe, 1985), a recent family genetics study has supported the presence of strong environmental input, and the absence of substantial indices of genetic influence, with respect to all four Strange Situation categories (Bokhorst et al., 2003). Moreover, while two molecular genetics studies involving one particular sample of 70 Hungarian infant–mother dyads seemed to point to particular genetic alleles related to disor-
organized attachment (Lakatos et al., 2000, 2002), these findings were not replicated in a larger sample \((n = 132)\) in the Netherlands, nor were they replicated when the Dutch and Hungarian samples were combined (Bakermans-Kranenburg & van IJzendoorn, 2004). It therefore appears that despite the species-wide nature of attachment behavior, placing virtually any infant in one of Ainsworth’s three rearing contexts (i.e., relatively stably sensitive, rejecting, or unpredictable parental behavior) or in the context elucidated by Main and Hesse (frightening parenting) is likely to produce one of the systematically predictable outcomes (secure, avoidant, ambivalent, or disorganized Strange Situation behavior).

Thus, although we believe that intriguing gene–environment interactions may yet be uncovered, at present it appears that the primary place to look regarding the origin of systematically differing behavioral displays during the Strange Situation is to systematically differing environmental input. Differing environmental input could of course lead to differing behavior via the activation of species-wide genes, “turning on” or “activating” differential displays according to the nature of the environment (e.g., certain environments could “turn on” genes controlling a prewired “avoidance behavioral program”). These genes—unlike those for high or low fear thresholds, each available to only some individuals—would then be present in all species members, but “activated” only when, for instance, the attachment figure is rejecting (see Belsky, 1999).

We have suggested instead that there exist species-wide abilities that are not part of the attachment system itself, but can, within limits, manipulate (either inhibit or increase) attachment behavior in response to differing environments. An example taken from Main (e.g., 1979, 1981, 1999) is the proposal that the display of attachment behavior can be inhibited so long as all species members have developed the ability to engage in (1) an organized shift of attention, (2) together with the capacity to tie this attentional shift to the inhibition of action.10

Review

To review, then, the phenomena of attachment appear in virtually all human infants, and are genetic in the nonheritable sense (i.e., all infants are similarly equipped, no matter what their parentage). At its most basic level, the attachment behavioral program is viewed as leading to (1) the formation of an early attachment to caregiving figures, given even minimally consistent social interaction, after which (2) propensities to seek that individual are aroused in stressfull or dangerous situations. And, again, this behavioral program is presumed to result from an evolved species-wide adaptation to particular dangers faced by ground-living primate infants.
At the same time, once an attachment has been formed, differences in the generation of rules for if, when, where, and how much attachment behavior should be exhibited with relation to a specific figure are now largely considered to depend upon the rearing environment. This is consistent with theory and research in fields concerned with other population-wide behavioral programs, which also focus mainly upon environmental rather than genetic sources of variation (Daly, 1996). Thus the capacity to inhibit (or, in contrast, maximize) the display of attachment behavior under certain circumstances can be seen as an indication of the operation of what are currently called “contingent decision rules” or, similarly, “conditional behavioral strategies” available for use in alternate and perhaps somewhat less psychologically “optimal” environments (see Hinde & Stevenson-Hinde, 1990; see also Belsky, 1999; Main, 1979, 1981, 1990; Simpson, 1999; Trivers, 1974). Although in theory these can arise via the environment-specific activation of organized (“prewired”) sets of genes available to the species as a whole, to date we have favored the hypothesis that differences in the appearance of attachment behavior simply depend upon the use of very general species-wide abilities (such as alterations of attention). However, even if these general abilities can, for example, inhibit the appearance of attachment behavior in circumstances in which it is expected, it nonetheless remains the case that the species-wide attachment system remains present and potentially ready to be reactivated.

THE BERKELEY LONGITUDINAL STUDY:
SAMPLE, METHODS, AND PERIODS OF DATA COLLECTION

With the discussion above in mind, we describe the first phases of the Berkeley Longitudinal Study of individual differences in parent–child attachment relationships. As many readers will be aware, by 1985 our laboratory had developed a number of new methods for assessing attachment. Besides Ainsworth’s original tripartite analysis of the Strange Situation procedure (described below), in this chapter we emphasize only four: (1) disorganized attachment, devised by us as a new category of infant Strange Situation behavior, together with its equivalents at age 6 and in young adulthood; (2) 6th-year reunion responses to the parents following a 1-hour separation; (3) Kaplan’s method of assessing transcripts of 6-year-olds’ responses to the Separation Anxiety Test (SAT); and (4) the AAI as administered at age 19. We selected these four measures for the sake of simplicity, and because for each our original findings have been well replicated. Moreover, training in each is now available.11
We report all tests run to date, and have yet to examine relations among the remaining measures devised in conjunction with our study. This is the case despite the fact that some of the remaining measures have proven to be promising.12

Characteristics of the Sample

Our sample was selected to be “low-risk” and “stable,” in the hope that our findings might serve to elucidate exactly those developmental transformations in attachment that occur under relatively consistent life conditions. We believed that only after the sequelae “naturally” arising out of enduring differences in attachment relationships have been delineated can researchers begin to trace—as P. T. Medawar put it in another context—the “variations which depart.”

The sample consisted of 189 Bay Area families drawn from birth records, with 84% of those contacted participating. The great majority of participants were middle- to upper-middle-class, and the majority of infants were secure. Sibling order varied; infants were healthy at birth and beyond; and mothers worked no more than 24 hours per week. Families with recent parent–child separations were excluded. Each infant was seen at 12 (or 18) months with the mother (or father), first in the Strange Situation, and a week later in free play and a structured “Clown Session” (Main & Weston, 1981). Each infant visited Berkeley four times over a period of 6 months, and each parent came twice. The sessions in which each parent participated were identical (i.e., one Strange Situation and one play session).

The 6th-Year Follow-Up and the “Move to the Level of Representation” in Attachment

When the children in the initial wave of the 3-year data collection had reached age 6, we brought a relatively modest subgroup (n = 40)13 back for a follow-up study. Until that time, consideration of the sequelae to individual differences in the infant’s attachment to the parent had been almost exclusively confined to behavioral outcomes, with numerous works emerging from Minnesota (as well as other laboratories) showing that children secure with their mothers at age 1 were highly favored in social and emotional development several years following (see Weinfield et al., 1999, for a review of the Minnesota studies).

Reasoning with Bowlby and many others that individual differences in behavior must be guided via differences in attention, thinking, language, and memory, we decided to investigate both children’s representational products (such as language usage and family drawings) and their responses to representations (such as pictured separations and family photographs).
While the children were examined in our playroom, we asked their parents (each in separate offices) for their life histories with respect to attachment (the AAI). Once parents and children were reunited just prior to leaving, their dialogues were recorded (see Main, Kaplan, & Cassidy, 1985). As we wrote in introducing the rationale for this “move to the level of representation,”

The aim of this chapter is to discuss individual differences in attachment relationships as they relate to individual differences in mental representation, that is, in the individual’s “internal working models” of attachment. . . . We define the internal working model of attachment as a set of conscious and/or unconscious rules for the organization of information relevant to attachment and for obtaining or limiting access to that information, that is, to information regarding attachment-related experiences, feelings, and ideations. Previous definitions of individual differences in attachment organization, for example, secure, insecure-avoidant, and insecure-ambivalent, have relied on descriptions of the organization of the infant’s nonverbal behavior toward a particular parent in a structured separation-and-reunion observation, the Ainsworth Strange Situation. . . .

Our re-conceptualization of individual differences in attachment organization as individual differences in the mental representation of the self in relation to attachment permits the investigation of attachment not only in infants but also in older children and adults and leads to a new focus on representation and language. This conceptualization leads further to the proposal that the secure versus the various types of insecure attachment organizations can best be understood as terms referring to particular types of internal working models of relationships, models that direct not only feelings and behavior but also attention, memory, and cognition insofar as these relate directly or indirectly to attachment. Individual differences in these internal working models will therefore be related not only to individual differences in patterns of nonverbal behavior, but also to patterns of language and structures of mind. . . . (Main et al., 1985, pp. 66–67)

In this 1985 study, we deliberately selected a subsample of 6-year-olds that consisted of approximately one-third disorganized/disoriented with their mothers during infancy, one-third secure, and one-third insecure-avoidant. We were unable to include an exploration of the insecure-ambivalent attachment category, as only two subjects were available. (Following the advent of the disorganized infant attachment category and its AAI equivalent, unresolved/disorganized, the ambivalent category and its adult equivalent, insecure-preoccupied, have become rare. This is because many individuals previously classified as insecure-ambivalent in infancy or preoccupied in adulthood have been found to be disorganized or unresolved. However, the interested reader should refer to Main [2000, pp. 1074–1076, 1086–1088; see also Cassidy & Berlin, 1994] for a
description of insecure-ambivalent Strange Situation responses, as well as related child and adult measures.)

Eighty-four percent of participants contacted agreed to return, and each measure was found to be strongly related to 1st-year attachment to the mother.

We present here the results of the two 6th-year measures that have most frequently been used to replicate or extend our original findings—namely, Kaplan’s (1987, 2003) version of the SAT (see Solomon & George, 1999, for an overview of the success of this measure and its close variants), and Main and Cassidy’s (1988) 6th-year reunion procedure (see a meta-analysis by Fraley, 2002, who found this reunion classification to be closely related to the same infants’ Strange Situation response in several independent samples).

**Follow-Up Study Conducted in Young Adulthood**

When the subset of individuals seen in the Social Development Project at age 6 (and a few others seen in these same procedures a few months later) began to reach age 19, we brought them back into the laboratory for a full day’s assessments. A surprising 90% of participants seen in this follow-up study contacted returned. As earlier, we divided this sample fairly evenly in terms of the offspring’s early attachment classification to their mothers, with 11–15 participants available from each classification (except for ambivalent/resistant, n = 2). As 13 years previously, both coders and interviewers were unaware of the participant’s response to all other assessments.

Despite the fact that we are testing strong hypotheses, we have erred on the side of caution and used only two-tailed tests, with significance set at \( p = .05 \). Because a subset of participants were utilized as pilot subjects for the 6th-year measures, the sample available at 6 is sometimes relatively small, with \( n = 42 \) (25 males) for comparisons between 1st-year and 19th-year procedures, and fewer at 6 years. Early classifications with father failed to predict either 6th-year or 19th-year outcomes, and hence our report focuses upon early attachment to the mother and its sequelae only.

The interviewers for the 19th-year follow-up study were two graduate students in clinical psychology at Berkeley, each trained by Erik Hesse across more than 30 hours in AAI protocol administration. Isabel Bradburn—then at Harvard, and unacquainted with the Bay Area sample—scored and classified the transcripts. Bradburn was regarded as an expert coder, since she had not only been certified in the 30-case reliability test provided by Main and Hesse in conjunction with AAI training, but also established 100% reliability with Hesse to subclass across a set of 14 transcripts. In addition, following Ainsworth’s stringent standards, we too required a high level of agreement across 100 Strange Situations for our coders.
Considered together, our standards for training and reliability have no doubt increased the opportunity to find matches between our 1st-year and 19th-year assessments, should these be present.

**ASSESSING SECURITY AT 1, 6, AND 19 YEARS: FROM SECURE ATTACHMENT TO THE MOTHER TO OVERALL SECURE-AUTONOMOUS STATES OF MIND**

Our chapter began with an overview of primate evolution, and the critical role of the attachment figure in providing protection to young infants. Before moving into a review of our own findings regarding infant security with the mother and its sequelae, we therefore remind the reader that, as primate anthropologist Sarah Hrdy has stated, “Lurking predators, not to mention strange males . . . or the prospect of maternal ambivalence are precisely the threats little primates ought to fear most deeply. What infants yearn for is the reassurance that they will never lose their caretaker’s love—that no matter what, [their attachment figures] will keep them safe from any lurking hazard. From an infant’s point of view, the desired message is best summed up by an Egyptian incantation from the 16th century B.C., chanted to forestall evil spirits covetous of the child—spirits who might otherwise approach under the cover of dark” (1999, p. 540). The ancient incantation Hrdy cites (p. 541) is, she asserts, the “lullaby” that the infant primate wants to hear and, “in the old mammalian recesses of his brain, emotionally processes to himself as he nestles against his caretaker’s breast . . . and falls securely asleep.”

*Hast thou come to kiss this child?*
*I will not let thee kiss him!*
*Hast thou come to silence him?*
*I will not let thee set silence over him!*

* . . . . . . . . . . . . . . . . . . . . . . *
*I will not let thee injure him!*
*Hast thou come to take him away?*
*I will not let thee take him away from me!*

**Identifying Security of Attachment to the Mother at 1 Year of Age: Procedure, Indices, and Relations to Maternal Sensitivity and Infant Secure-Base Behavior in the Home**

Security of attachment in infancy was first explored in Uganda, via Ainsworth’s (1967) extensive home observations of 26 infant–mother dyads. Among the dyads Ainsworth considered secure, the infants showed
a notable absence of anxiety in their mothers’ presence, although they took flight to their mothers as “havens of safety” in times of alarm. Later, in studying her Baltimore sample, Ainsworth additionally identified infants as secure in the home when they were accepting both of being picked up and put down; when they showed little distress when the mothers left a room, but greeted them positively upon return; and, most importantly (Waters, Vaughn, Posada, & Kondo-Ikemura, 1995), when they used their mothers as “secure bases” for exploration.

We begin these delineations of security of attachment as inferred from infant home behavior, because—particularly among researchers working outside the field—security has undoubtedly become too closely identified with certain kinds of behavioral responses to the Strange Situation procedure (see Grossmann, 1990; Grossmann & Grossmann, 1990). Although security as assessed in this procedure was found to be strongly related to security as identified independently in the home, it is, as Waters informally has put it, “a sign, not a sample” of what goes on in the home. For example, most securely attached infants eventually cry when left alone in the unfamiliar laboratory room—a behavior almost never exhibited when their mothers change rooms at home.

As noted earlier, Ainsworth deliberately structured the Strange Situation procedure to include three of Bowlby’s (1969/1982) “natural clues to danger” as he envisioned their appearance within a ground-living primate’s “environment of evolutionary adaptedness.” Each was expected to arouse some propensities to seek proximity to the attachment figure. Moreover, these clues to danger (the “activators” of attachment behavior, such as separation) were intentionally succeeded by what we might now term clues to safety (to Bowlby, 1969/1982, “terminators” leading to the reduction or cessation of attachment behavior)—namely, the attachment figure’s proximity. The procedure therefore consists of eight episodes, and, following a 1-minute introduction to the room by a research assistant, the succeeding seven are each designed to be 3 minutes in length. However, when an infant is strongly distressed, an episode is terminated in less than 30 seconds. Following introduction to the room, then, the episodes of what Bretherton once called this “miniature drama” are as follows:

**Episode 2.** The mother (or other primary caregiver) and infant are left alone in a toy-filled environment whose unfamiliarity supplies the first natural clue to danger. However, the mother’s presence is expected to provide the infant with security sufficient for interested exploration and/or play.

**Episode 3.** Providing a second clue to danger, a stranger joins the mother and infant. Since Ainsworth first designed this procedure, new stud-
ies of primate troops have affirmed that strangers do provide a clue to possible danger (see Hrdy, 1999).

- **Episode 4.** The mother leaves the infant with the stranger, providing two combined clues to increased danger. At this time, the infant often cries and begins to search for the mother, who has left her purse or other belongings behind to assure her intention to return.

- **Episode 5.** The mother returns, and the stranger unobtrusively departs. The mother—who throughout this procedure has been otherwise asked to “behave as you normally would,” but not to “attempt to direct the infant’s activities”—calls from outside, then pauses in the doorway to permit the infant time to mobilize a response. Many infants initially seek proximity but then, reassured of their mothers’ nearness, resume play.

- **Episode 6.** The mother leaves, reassuring the infant of her return, and the infant remains entirely alone in the unfamiliar setting. Infant distress can be strong at this point, and this episode is often terminated rapidly. Note that in the environments of evolutionary adaptedness in which humans and other primates evolved, calling and searching immediately upon being left alone would usually be a requirement for survival (see Hinde, 1974; Hrdy, 1999).

- **Episode 7.** The stranger, rather than the mother, enters the room. Here Ainsworth wished to ascertain whether any distress exhibited has resulted simply from being alone without general companionship, or is due specifically to the absence of the attachment figure.

- **Episode 8.** This is the second and final reunion episode. The mother returns as in Episode 5 (again, the stranger leaves unobtrusively), but this time she is instructed to try to pick the infant up. By now, most infants are expected to be crying, and actively and rapidly not only seeking proximity to their mothers, but also perhaps pulling themselves up on the mothers’ legs and indicating a strong desire to be held. They may also require a somewhat lengthier period of holding than is typical for Episode 5. Nonetheless, they are expected to settle and renew their interest in exploration and play by the end of this final 3-minute period.

In the Strange Situation as outlined above, the following behaviors encapsulate the form of infant response that Ainsworth ultimately termed “secure.” To summarize, an infant who is judged secure in relation to a particular parent does the following:

- Plays happily with the toys and explores the environment prior to separation.
- Shows signs of missing the parent during separation, such as crying or calling.
• Seeks proximity immediately and actively at least by the time of the second separation, often indicating as well a desire to be held.
• And, before the end of each 3-minute reunion episode, returns to exploration and play, “secure” once again in the parent’s presence.

Ainsworth found that a “secure” response to the mother in the Strange Situation was associated with the mother’s “sensitivity to infant signals and communications” in the home, including (1) perceiving that a signal had occurred, (2) interpreting it accurately, (3) responding promptly, and (4) responding appropriately. In Ainsworth’s sample (unequaled to this date in the extensive time given to home observation—i.e., 66 waking hours across the first year), the association between maternal sensitivity and security was very strong (Ainsworth et al., 1978).

Assessing Security at 6 Years at the Behavioral and Representational Levels: Procedures, Indices, and Relations to Early Security with the Mother

Sixth-Year Reunion Responses: Secure

At the conclusion of our assessments of 6-year-olds and their parents as described by Main and colleagues (1985), we included a deliberately casual parent–child reunion. Here, once both parents had completed the AAI in separate offices, one would return to the playroom, followed in 3–5 minutes by the second. Parents were then asked to sign some final consent forms and to prepare the child for leaving. Six-year-olds were termed “secure” when no major changes in affect or behavior appeared on hearing their parents’ approach, and when they calmly but affectionately welcomed them, easily incorporating them into their ongoing activities and play. This response was strongly related to early security with the mother (Main & Cassidy, 1988). Children secure in infancy were also less likely than others to have shown distress during the hour-long separation (Cassidy & Main, 1984).

Sixth-Year Responses to Kaplan’s Version of the SAT: Secure-Resourceful

In the SAT, the participant is presented with pictures of various kinds of parent–child separations. What is happening during each separation is clearly described by the examiner, and then followed up by questions regarding what the separated child might feel or do. This method was originally devised for use with adolescents (Hansburg, 1972), but was adapted for 6-year-olds by Klagsbrun and Bowlby (1976).
Kaplan (1987) retained the above-described six separation photographs, and as in the Klagsbrun and Bowlby version of the SAT, the examiner asked what the pictured child would feel, as well as what the pictured child would do. Rather than counting frequencies of precategorized answers, however, Kaplan transcribed the entire conversational exchange, and then analyzed the text via a new system. The SAT text was considered “secure” if the pictured child (1) expressed feelings of sadness, anger, or some other form of distress, and also (2) was able to provide a “constructive solution” for the pictured child (e.g., persuading the parents not to leave, or finding something positive to occupy the child during the parents’ absence). It is interesting to note that, taken together, these 6-year-old responses indicate both the early development of an open valuing of attachment (as seen in response to the “feel” questions), and an early development of autonomy (as evidenced in the “constructive” answers to the “do” questions). This SAT response was strongly related to early security with the mother in the Strange Situation, and was called “secure-resourceful.”

The Adult Attachment Interview: Assessing Security via Language at Age 19

The AAI is a well-known procedure for assessing “state of mind with respect to attachment” in young adulthood and beyond (see Hesse, 1999a). The AAI protocol (George et al., 1984, 1985, 1996) consists of 18 questions, with set probes. The interview generally takes about 1 hour (ranging from 40 minutes to almost 2 hours), and is transcribed verbatim, including place-holding responses (“um . . . uh”), stammers, and so forth. During the interview, speakers are repeatedly asked to describe their attachment histories. This includes a call for the selection of five adjectives that would, in the speaker’s view, best describe the relationship with each parent (first the mother, and then the father). Speakers are then asked for memories or specific incidents to support each adjectival choice. They are asked which parent they were closer to, what happened when they were hurt or ill, whether they experienced threat or abuse from parents, and whether any of their early experiences with parents seemed to them to create a “setback” to their further development. They are also asked to discuss and evaluate the import of any critical loss experience(s) occurring throughout their lifetimes.

Before we report the AAI security findings for our young participants at age 19, it will be helpful to discuss earlier research with the AAI. Ruth Goldwyn and Mary Main initially created a three-category system for scoring and classifying the AAI (Main & Goldwyn, 1984; see Main et al., 2003, for the most recent, five-category version of this system). Using a “develop-
ment sample” of 44 out of 110 available texts (i.e., 44 texts wherein infant Strange Situation behavior was known), they then attempted to sort out differences in speech among the parents of children who as infants had been placed in one of Ainsworth’s three categories of the Strange Situation 5 years earlier. (Note additionally that while Ainsworth had created three major and 8 subclassifications for the Strange Situation, we have ultimately created five major and 12 subclassifications for states of mind seen in the AAI; Main et al., 2003).

From the first, it became clear that it was not the content of the parents’ apparent history or “experiences” with respect to their own parents, but rather their mental state with regard to those apparent experiences, that differentiated AAI texts of individuals whose infants were securely versus insecurely attached to them. Borrowing a term from philosophy, we eventually referred to this as an individual’s “overall state of mind with respect to attachment.” In fact, what distinguished the AAI texts of the parents of infants who had been judged secure with them in the Strange Situation could be described as “valuing of attachment relationships and experiences, but coherent and apparently objective regarding any particular relationship or experience.” These “secure-autonomous” texts underscored a speaker’s ability to value relationships, while simultaneously taking an internally consistent or “autonomous” stance toward any individual person (for other explorations of autonomy as related to the AAI, see Allen & Hauser, 1996; Waldinger et al., 2003).

Because coherence was the overall key to secure-autonomous status in adults, not only participants reporting favorable early experiences, but also those describing untoward ones, could be and were found to have secure babies. Speakers who were coherent despite apparently unfavorable backgrounds were termed “earned secure” (alternatively “discontinuous secure”).

Having looked “down” on our interview transcripts from the categorical to the subcategorical level by creating taxonomic descriptors, we began to develop continuous scales for “probable experiences” with each parent during childhood, as well as scales representing various aspects of a speaker’s apparent “state of mind” with respect to particular persons or experiences. These included, for example, “idealization,” “preoccupied anger,” and “unresolved/disorganized responses to loss or abuse.” We also developed scales to represent specific recurring speech usages, such as “vague speech” and “insistence on lack of memory.” Some of these scales will be discussed in greater detail later.

Expectable relations between the continuous scores assigned for varying overall classifications or “states of mind” are outlined in a table; this allows the coder to work up from scale score configurations towards the final classification.15 However, coders also double-check their categoriza-
tion via a set of generalized descriptors delineating each category and then subcategory. This is why we often refer to classifying an AAI text as a task that combines “bottom-up” (scale-to-category) and “top-down” (category-to-subcategory) approaches.

The central scale ascertaining the extent to which a speaker evidenced a secure-autonomous state during this life history interview was termed “overall coherence of transcript” (this scale was created several years prior to our first reading of Grice). We found that where parental texts were coherent, the child (seen with the same parent) had tended to be secure (Main & Goldwyn, 1984), whereas incoherent texts tended to come from the parents of insecure infants.

Later, as Main began to read the work of the linguistic philosopher Grice and discovered his four “conversational maxims” for cooperative, rational discourse (Grice, 1975, 1989), we began to refer to “coherent” AAI texts as both “consistent” (in keeping with Grice’s maxim of “quality” or “truthfulness”—i.e., being internally consistent, or thus most probably “truthful”) and “collaborative” (being appropriate in length of conversational turn, or, in Grice’s terminology, adhering to the maxims of “quantity,” “manner,” and “relevance”). However, speakers could also “license” violations of any maxim (e.g., in regard to quantity, opening a conversational turn with “Well, this could be a really long story”; see Mura, 1983).

Following Goldwyn’s coding of our remaining 66 AAI transcripts (conducted without knowledge of the infant’s Strange Situation behavior), we were able to reconfirm that both mothers and fathers manifesting a secure-autonomous state of mind most frequently had had babies judged secure with them 5 years previously (Main & Goldwyn, 1984; see also Main et al., 1985). These findings have been well replicated, and in van IJzendoorn’s (1995) meta-analysis across 18 samples (854 dyads), parents whose AAI texts were classified as secure-autonomous were likely to have had secure babies, while parents whose AAI texts were incoherent during the discussion of their life histories (i.e., were not secure-autonomous) were likely to have had insecure offspring. This association (75%) was very strong (effect size \(d = 1.06, r = .49\), biserial \(r = .59\)), and a statistic utilized by van IJzendoorn led to the conclusion that it would take more than 1,087 further studies with null results to reduce these findings to insignificance. In addition, van IJzendoorn’s meta-analysis showed that mothers (and fathers) whose AAI texts were classified as secure-autonomous were more sensitive and responsive than others to their offspring.

AAI classifications assigned to a given speaker have now proven stable across periods extending to 5 years (see Crowell & Waters, Chapter 9, this volume); AAI coherence in the discussion of life history has repeatedly been discriminated from simple intelligence or verbal fluency, and is independent of interviewer (see Bakermans-Kranenburg & van IJzendoorn, 1993; Sagi
et al., 1994); and Waters and his colleagues have demonstrated that patterns of discourse discriminating among AAI categories arise specifically when life history with respect to attachment is being discussed, as opposed to the technical aspects of work history (Crowell et al., 1996). Among the pioneering studies involving the AAI (each now well replicated), several included parents whose interviews were conducted before their first infant was born (e.g., initially, Fonagy, Steele, & Steele, 1991); several used high-risk samples (e.g., initially, Ward & Carlson, 1995); several discriminated clinically distressed from control participants (initially, Crowell & Feldman, 1991); and several showed that parental AAIs are predictive of maternal sensitivity (e.g., Grossmann, Fremmer-Bombik, Rudolph, & Grossmann, 1988). Each of these researchers had attended one of the two first AAI institutes, organized by Mary Ainsworth (1985) and then by John Bowlby and John Byng-Hall (1987).

It should be noted in closing this discussion, that, unlike the Strange Situation behaviors of infants (see below), the AAI texts of adults are judged “secure-autonomous” not regarding any other particular person or relationship, but rather with respect to the overall state of mind that arises during discussion of an entire series of topics and relationships. In theory, then, an adult with all attachement figures deceased and no close relationships available could still be secure-autonomous and raise secure offspring. In strong contrast, an infant or young child in this same position could not be judged secure, since his or her attachment status is always identified with respect to a particular person (e.g., “securely attached to father”).

We now specifically examine the 19th-year AAI responses of our young participants. The first question we address is, of course, whether children securely attached to their mothers on our 6th-year measures or during infancy would become secure-autonomous 13–18 years later on the AAI.

Secure-Autonomous States of Mind in Young Adulthood as Related to Earlier Security

Both secure responses to the mother in the 6th-year reunion procedure, and secure-resourceful status on Kaplan’s version of the SAT, significantly predicted a secure-autonomous state of mind on the AAI when the participant had reached age 19. In addition, a significant match was uncovered between infant security (or insecurity) with the mother at age 1 and secure-autonomous (or insecure) status on the AAI 18 years later.

In all analyses, there was an especially low likelihood that a child judged insecure would be judged secure-autonomous on the AAI. Moreover, according to the criteria long established within the AAI manual
(Main & Goldwyn, 1984–1998; Main et al., 2003), not one of our 26 participants insecure in infancy was classified “earned secure” at 19. This finding is understandable, given the age of the sample (cf. Roisman, Padron, Sroufe, & Egeland, 2002, who also found few or no “earned secure” subjects in their poverty sample at age 19, when using the AAI manual criteria).

Similar significant infant Strange-Situation-to-AAI matches in adolescence or young adulthood have been reported in three other U.S. samples—specifically, those of Hamilton at UCLA, and of Waters working with his original Minneapolis middle-class sample (Hamilton, 2000; Waters, Merrick, Trevoux, Crowell, & Albersheim, 2000) and most recently by Sroufe, Egeland, Carlson, and Collins (2005) on predicting AAIs for the Minnesota poverty sample at age 26. Relatedly, even prior to these reports, Benoit and Parker (1994) had found strong matches between mothers’ security versus insecurity on the AAI and that of their adult daughters. This finding allows us to posit (although it cannot prove) predictability across time on the part of the adult offspring and also, of course, continuity from infancy to adulthood. Finally, Beckwith, Cohen, and Hamilton (1999) found that maternal insensitivity—a substantial correlate of infant insecure Strange Situation behavior—predicted insecure-dismissing adolescent AAIs from 1 month through 24 months of age.

The participants in each of the samples referenced above were Americans or Canadians. Early (19-year as opposed to 26-year) results for the Minnesota poverty sample (Weinfield, Sroufe, & Egeland, 2000) and for two German middle-class samples differed. For example, in the high-stress Minnesota poverty sample, infant security with mother in the Strange Situation failed to predict secure-autonomous status on the AAI at age 19 (n = 125; Weinfield, Whaley, & Egeland, 2004). It is critical to note, however, that in the Minnesota poverty sample, as opposed to the Berkeley (Main & Weston, 1981) and Minnesota (Sroufe & Waters, 1977) middle-class samples, 12- to 18-month stability in Strange Situation behavior to mothers was significant, but low (62% stability; Vaughn, Egeland, Sroufe, & Waters, 1979). One interpretation of the initial 19-year results could be that in a high-stress context, the frequent disruptions and changes occurring in early relationships may fail or else take longer to “stabilize” the offspring’s mental organization with respect to attachment sufficiently to predict long-term outcomes.

Furthermore, in presenting the combined results for their two German middle-class samples (Bielefeld and Regensburg), the Grossmanns report only a partial replication of our findings (Grossmann, Grossmann, & Kindler, Chapter 5, this volume). As in our study, below, secure versus insecure responses to the AAI could be predicted forward from middle childhood,
but—in contrast to our investigation and to those noted above—were not predictable from infancy. However, D codes were not utilized in the German reports, since D coding was available for the Regensburg but not the Bielefeld sample, and the Grossmanns wished to report pooled findings.\textsuperscript{17}

In our Bay Area study, we have gradually begun to place increased emphasis on the continuous scales underlying the taxonomic aspects of both the Strange Situation and the AAI. Among her four 7-point scales assessing aspects of infant reunion response, Ainsworth regarded “proximity seeking” as the most strongly indicative of infant security. We therefore correlated proximity-seeking scores at age 1 with scores assigned to the same participants for our central AAI scale, “coherence of transcript.” At the high end of the proximity-seeking scale, the infant immediately, actively, and fully approaches the parent on reunion. At the high end of our 9-point scale for coherence, the speaker is (following Grice, 1975, 1989) reasonably internally consistent and clear, with conversational turns being relevant and appropriate in length. The correlation between these two central continuous scales—proximity seeking in infancy and coherence of transcript on the AAI—was strong over the 18-year period. However, given our paucity of ambivalent-resistant (“C” infants, \( n = 2 \)), our results could be sample-specific and should be tested in samples with higher proportions of C babies. Also, prior to Main and Solomon’s (1990) discovery of D, van IJzendoorn and Kroonenberg (1990) had published an algorithm for Strange Situation continuous scales that, like proximity seeking, appears to well represent overall infant security.

\textit{AAI Estimates of Mothers’ “Loving Behavior during Childhood” as Compared to Early Security}

As noted earlier, near the outset of the AAI, speakers are asked to illustrate each of the adjectives they have selected to describe their early relationship to each parent (“support” in the sense of providing specific descriptive incidents), and are then queried regarding parental responses to injury, illness, separation, and so on. The coder’s best estimate of parental loving behavior during the speaker’s childhood is rated on a 9-point scale (mother and father are scored separately). Again, a coder often assigns a higher or lower rating for overall loving behavior in childhood than would be assigned based on the speaker’s choice of adjectives.

To the best of our knowledge, we may be the first researchers to examine AAI coders’ “accuracy” in estimating early experiences with the parent. But how could this be done? As was already known, maternal sensitivity scores assigned in infancy relate \textit{prospectively} to infant security
in the Strange Situation (Ainsworth et al., 1978; see also De Wolff & van IJzendoorn, 1997). With this in mind, we undertook a retrospective examination of whether, as based on Strange Situation responses assessed in infancy, an AAI coder’s estimate of the mother’s loving/“sensitive” behavior in childhood reflected a participant’s likely early experience of maternal sensitivity. This undertaking was admittedly somewhat awkward, given that we had no direct measure of maternal sensitivity, and should therefore be attempted again in laboratories with direct access to sensitivity measures. Note also that (a) coder estimates, not specific participant “memories,” are being utilized and (b) this correlation will be lowered in any sample having a high proportion of “earned secure” adults (see also footnote 18).

Nonetheless, we did find an impressively significant relation between our AAI coder’s estimate of maternal loving behavior in childhood as derived from texts produced by 19-year-olds, and the same speaker’s observed overall security with their mothers in the Strange Situation. The AAI coder’s estimate of maternal loving behavior during childhood was related even more strongly to secure 6th-year reunion behavior toward the mother, and to Kaplan’s security estimates for the SAT.18

Consideration of the Role Played by Intervening Trauma

Starting with Waters and colleagues’ (2000) study, which linked Strange Situation security with the mother to secure-autonomous status on the AAI, researchers have looked to intervening trauma to explain changes in attachment status. Among the participants in our study, no intervening abuse by parents was reported. However, nine subjects had experienced other forms of trauma—specifically, death of a parent or close parental figure; an ongoing fatal illness in a parent; or a long, potentially fatal illness in the self. We found that intervening trauma had occurred at about three times the rate among participants who were discontinuous in attachment as among those who were continuous, and this result was highly significant. Interestingly and unexpectedly, one participant who had been insecure-disorganized with the mother in infancy had become secure in response to intervening trauma, directly describing the intervening traumatic experience as causal in changing their behavior and feelings toward their family.

When participants with trauma were removed from our analysis, the percentage of secure versus insecure Strange-Situation-to-AAI matches increased, as it had in other laboratories—in ours, to well above 80%. However, because the removal of these nine subjects markedly reduced our sample size, all data reported in the remainder of this presentation include the sample as a whole.
Security: Summary

1. Drawing on Ainsworth’s original observations, we can understand secure Strange Situation behavior as a function of earlier experiences of maternal sensitivity and responsiveness (Ainsworth et al., 1978), or, in our more recent terms, as the result of repeated experiences of “fright/distress with (ready) solution” (see Hesse & Main, 1999).

2. Security with the mother at 1 year of age predicted a secure reunion response to her at age 6, as well as a failure to show marked distress or anger during the hour-long separation.

3. Security at 1 year predicted secure-resourceful responses to the SAT.

4. At 6 years, both a calm, secure reunion response, and a secure-resourceful response to the SAT (the pictured child misses the parent, but can act constructively during the separation), predicted a secure-autonomous AAI at 19 years. Each of these 6th-year responses (as well as the failure to show distress on separation seen at 6) is suggestive of a developing sense of autonomy, increasing our understanding of the pathway to secure-autonomous states of mind in young adulthood.

5. Infant security versus insecurity with the mother in the Strange Situation predicted a secure-autonomous versus an insecure AAI. This result has also been reported for two middle-class U.S. samples and for the large Minnesota poverty sample at age 26.

6. Continuous scores for “proximity seeking” during the Strange Situation (Ainsworth’s primary continuous index of infant security) predicted continuous scores for “coherence of transcript” on the AAI (the primary continuous scale estimating security in the AAI). This finding may, however, be sample-specific due to our low number of insecure-ambivalent infants.

7. Change in security status between the Strange Situation and the AAI was strongly related to intervening trauma. With cases involving trauma omitted, a substantial as opposed to a slight majority of secure infants were found to have become secure-autonomous, and the secure–insecure match between infancy and the AAI was well above 80%.

8. The scores AAI coders assigned to the participants’ mothers for “loving behavior during childhood” were significantly correlated with observed security with the mothers at both 1 and 6 years. Despite the absence of direct measures of maternal sensitivity, this implies a surprising accuracy of coder “experience” estimates, at least in samples with few participants who are “earned secure.”

9. Many of the results above can be interpreted in terms of a continuing flexibility of attention. This is shown at 1 year in alternating attention between the mother and the toys during the Strange Situation, and at 6 years via the secure-resourceful capacity both to express distress and to find...
constructive solutions during the SAT. It is exhibited again at age 19, where the speaker alternates smoothly between attending to the interviewer’s queries and coherently responding to them (Hesse, 1996; Main, 1995).

**ASSESSING AVOIDANCE OF THE ATTACHMENT FIGURE AT 1 YEAR, AND ITS EQUIVALENTS AT 6 AND 19 YEARS OF AGE**

Avoidance is commonly identified by absence of responsiveness when another individual approaches or offers positive overtures. Avoidant behavior includes ignoring, looking away, turning away, moving away, and showing an apparent “lack of recognition.” Although the first formal scoring and classification system for avoidance was, to the best of our knowledge, developed by Mary Ainsworth and her collaborators (see Ainsworth et al., 1978), the phenomenon has long been noted in human history. A specific early illustration of the association between avoidance and reunion following long separations is given in *The Odyssey* of Homer (circa 700 B.C.). Here Penelope, 20 years separated from her husband, has just been informed by her son that—having recently triumphed over her many suitors—Odysseus is once more within her halls. She descends to meet him.

> *Telemachus’ voice came to her ears:*

> “Mother, cruel mother, do you feel nothing, drawing yourself apart this way from Father? Will you not sit with him and talk and question him? What other woman could remain so cold? . . . Your heart is hard as flint and never changes!”


Within the field of attachment, the best-known examples of avoidance following separations are based on the early observations of Robertson and Bowlby (1952) and Heinicke and Westheimer (1966). In both investigations, toddlers subjected to separations lasting weeks to months in which they resided in stressful, unfamiliar environments came to actively avoid and ignore their primary attachment figures. In an important and surprising contrast, secondary figures, together with neighbors and others, were
readily greeted and recognized. Heinicke and Westheimer proposed that the initial avoidant response to reunion could be best understood as serving a defensive function, permitting a child to maintain control over an anger (and probably also, distress) that had grown too intense to otherwise permit continued behavioral organization (see also Main, 1981).

**Identifying Avoidance of the Mother during Infancy: Indices, and Links to Maternal Rejection and Infant Expressions of Anxiety and Anger in the Home**

By the time she undertook her Baltimore study of infant Strange Situation behavior, Mary Ainsworth had already spent several years in London becoming well acquainted with the work of Bowlby, Heinicke, and Robertson, with its focus upon the avoidance of the parent as described above. However, she had no expectation that avoidance could occur (1) following very brief (30-second to 3-minute) separations (2) in home-reared 1-year-olds (3) who had undergone no previous major separation from their parents (M. Ainsworth, personal communication to M. Main, 1979). In the laboratory, she expected to see only proximity seeking following these separations.

An infant who is judged avoidant not only does not cry when left by the mother and fails to greet her on reunion, but also actively avoids looking at her, indicates a wish to be put down if picked up, and explores the toys and room throughout the procedure. This imbalance between exploration and attachment behavior in relation to changes in cues regarding danger and safety suggests the active presence and use of restriction of attention under moderate stress (Main, 1995). Thus, unlike secure infants, who demonstrate flexibility in attention, avoidant infants attend virtually inflexibly to the toys or inanimate environment throughout the procedure.20

We can summarize the Strange Situation behavior that leads to placement in the insecure-avoidant attachment classification (Ainsworth et al., 1978) as follows:

- Like secure infants, these infants play or explore prior to separation.
- However, an avoidant infant ignores—or appears, at the least, indifferent to—the parent’s leave taking on both the first and second separations.
- When left alone entirely, the infant fails to cry and continues to explore the room.
- On reunion, the infant ignores and avoids the parent. If picked up, the infant indicates a desire to be put down, and if called, will most likely turn away to a toy, or even will move (sometimes sharply) further away from the parent.
Intriguingly, in reviewing her narrative records, Ainsworth found that four of her six avoidant infants had shown strong anxiety regarding mothers’ taking leave in the home, so that behavior in the stressful Strange Situation procedure appeared to involve a suppression of their more usual expressions of distress and anxiety. In addition, as Main and Stadtman (1981) discovered, avoidant infants expressed strong anger toward their mothers in the home, but little or none in the Strange Situation.

Ainsworth’s records also revealed that avoidance in the Strange Situation was sharply associated with the mother’s rejection of attachment behavior in the home (Ainsworth, Bell, & Stayton, 1971; Ainsworth et al., 1978)—a finding replicated by Main and Stadtman (1981) for two further independent U.S. samples. Rejection was exemplified in refusal of tactual contact with and proximity to the infant and, in Ainsworth’s sample, in direct statements such as “I wish I had never had this baby.”

Assessing Avoidance at 6 Years at the Behavioral and Representational Levels: Indices and Relations to Early Avoidance of the Mother

Sixth-Year Reunion Responses: Avoidant

Main and Cassidy (1988) found that at age 6, previously avoidant infants were distinguished by their continued, but now less overt, avoidance of proximity and conversation. Rather than completely refusing to communicate when addressed, as they often had at age 1, these children allowed a small time lapse prior to taking their conversational turn, and then responded minimally (e.g., “Yeah,” “That one,” “It’s over there,” “Nope”). They also edged subtly away from their mothers, and as in infancy, increased attention to the toys and other inanimate objects (or, in a few cases, the examiner). The similarity to their behavior during infancy was obvious, and despite their now more “socially appropriate” demeanor, they were easily identified. The relation to early avoidant status with the mother was strong (this finding was replicated in Regensburg by Wartner, Grossmann, Fremmer-Bombik, & Suess, 1994).

Sixth-Year Responses to Kaplan’s Version of the SAT: Insecure-Inactive

Surprising in prospect, children avoidant of the mother during infancy gave responses to the “feel” questions of the SAT virtually indistinguishable from those of the secure children (the separated child was described as feeling sad, crying, or feeling angry). However, in direct opposition to the secure children, who then offered “constructive” solutions as to what a
separated 6-year-old could do about the situation, previously avoidant children typically responded with “I don’t know,” “Nothing,” or even “Run away.” Kaplan termed this response pattern “insecure-inactive,” since the child seemed unable to imagine a useful or constructive strategy for acting on his or her self-admitted feelings (Kaplan, 1987; Main et al., 1985).

**Dismissing States of Mind in the AAI**

From their first examination of their 44 “development” AAI transcripts in the early 1980s, Main and Goldwyn found it relatively straightforward to discriminate the texts of the parents of avoidant infants. This was because—at least during the semistressful task of describing and evaluating early attachment relationships and their influences—these parents (ultimately termed “dismissing of attachment”) seemed strongly to resemble their infants (who had behaviorally “dismissed” both separations from and reunions with their mothers under stress). Overall, parents who attempted to avoid the topics of attachment experiences and any untoward effects were termed “dismissing,” “devaluing,” or “cut off” from attachment relationships and experience.

In most texts judged dismissing, the speakers described their early relationships to their parents as good or normal, and themselves as strong and/or independent. Thus, just as their infants behaved in the Strange Situation as though nothing untoward was happening, and showed little or no overt distress in the face of what in fact for an infant are highly stressful circumstances, their parents spoke as though their childhoods had included little or no real difficulty, tending to use positive to highly positive adjectives for one or both parents. However, given the positive adjectival constellation usually provided, these texts were considered inconsistent in that the speakers usually then failed to support their adjectival choices (“I said she was loving because she was caring”), or even actively contradicted them (a “very loving” mother may, later in the text, have been described as having gotten so frequently angry with the speaker for hurting himself that he once had hidden a broken arm) either immediately or later within the interview. These inconsistencies lead to a score for “idealization of the mother,” and a strong tendency to idealize one or both parents is perhaps the primary index used to place a text in the dismissing AAI category. In sum, then, like an infant who “ignores” the natural clues to danger implicit within the Strange Situation procedure, the dismissing interviewee has attempted to act as though all is/was well (“tutto bene”), despite weak or even contradictory evidence.

Another transcript characteristic pointing to this category is a tendency to cut the interview or interview response short via what we have come to call “insistence on lack of memory” for childhood events and rela-
tionships. Of course, some thoughtful speakers will worry about whether they are able to remember as much as seems to be called for in the interview, and will say that they do not know whether they remember much, but that they will try. The discourse strategy that we have come to call “insistence on lack of memory” differs from this, in that the speaker indicates not only inability, but perhaps also unwillingness, to proceed with an attempt to respond (“I don’t remember. No. I just can’t remember anything about that”).

We do not know at present whether these speakers in fact cannot remember, or are simply attempting to block discourse, or some combination. Nonetheless, such attempts to dismiss the topic tend to mark the AAI texts of the parents of avoidant infants.

Again, all of the AAI scales dealing with the “organized” categories (e.g., idealization, insistence on lack of memory, coherence) were devised by Main and Goldwyn by 1984, prior to Main’s reading of Grice in 1988. Nonetheless, it can be seen here that idealization is a violation of Grice’s maxim of quality (“Be truthful, and have evidence for what you say”), while insistence on lack of memory is a violation of Grice’s maxim of quantity (“Be succinct, and yet complete”), in that the response is excessively brief. Note that the indices leading to high scale placement are reminiscent of infant avoidance, where the infant seems “not to remember” (i.e., behaviorally indicates that “nothing has happened”) either that the parent has left, or that the parent is important at return.

In van Ijzendoorn’s (1995) meta-analysis of studies comparing parental AAI status and infant Strange Situation response to that same parent, the relation between a mother’s or father’s dismissing AAI status and the infant’s tendency to be classified as avoidant with that parent was very strong, with an effect size of 1.02 (equivalent to \( r = .49 \)).

**Dismissing States of Mind in the AAI as Related to Avoidance in Childhood and Infancy**

When we looked forward from the 6th-year reunion to the AAI in the Berkeley Longitudinal Study, a strong majority of avoidant children had become dismissing. However, the chi-square for association between a child’s 6th-year reunion status as avoidant and dismissing (vs. not-dismissing) status on the AAI was not significant, due to the fact that many children who had not been avoidant on reunion at 6 were also found to be dismissing (the majority of these had been disorganized).

A majority (9 of 11) of children who had been insecure-inactive (avoidant) on the SAT at age 6 were, as expected, judged dismissing on the AAI 13 years later. However, the chi-square test was again not significant, since, as in the case of the 6th-year reunion, many children who were not
insecure-inactive at six (largely D-controlling) had also become dismissing by the time of the AAI.

When we moved to an examination of relations between infancy and the AAI, our results were much the same, with 10 of 11 children avoidant of their mothers during infancy being classified as dismissing of attachment on the AAI. As in the case of 6th-year responses, however, dismissing responses also occurred in formerly disorganized infants. Consequently, the overall association with infant avoidance was not significant.

Finally, we examined our continuous Strange Situation scales in conjunction with the appropriate AAI scales. Ainsworth’s 7-point scale for avoidance is, like proximity seeking, averaged across the two reunion episodes (refusal to greet the parent immediately upon reunion, and also ignoring her further attempts to attract attention, are scored high, while briefly turning or looking away is scored low). Avoidance of the mother significantly predicted idealization of her 18 years later in the AAI, as well as insistence upon lack of recall for childhood.

As noted above (pp. 254–255), we have proposed that avoidance may represent the early development of a “conditional” or “alternative” behavioral strategy available for surviving in altered or nonoptimal circumstances. Specifically, an avoidant conditional strategy may permit the infant raised by a relatively rejecting (but not frightening) mother to maintain whatever proximity to her is possible (Main, 1981). In other words, our reasoning has been that approach to a mother who normally rejects the infant’s proximity seeking would be especially likely to chance increasing danger (infant–mother distance) in unfamiliar settings.

Avoidance of a nonfrightening but rejecting attachment figure is, then, seen by us as a compromised (but optimal in context) response to situations of fright stemming from the external environment (see Belsky, 1999). Furthermore, perhaps precisely because it reduces attention to the withdrawal-prone, rejecting mother, avoidance may simultaneously permit the adaptive maintenance of self-organization, as opposed to dysregulating combinations of tendencies to approach, take flight, or express hostility. In other words, organized avoidance may permit the infant to maintain whatever degree of proximity to the mother seems currently possible.

Avoidance: Summary

1. Avoidance of the mother in the Strange Situation is associated with experiences of rejection of attachment behavior in the home.

2. At age 6, a strong majority of children who had been avoidant of their mothers at age 1 avoided her on reunion.

3. Similarly, a strong majority of children who had been avoidant at 1 were insecure-inactive on the SAT at 6.
4. Both children classified as avoidant on reunion and children classified as insecure-inactive on the SAT at age 6 were very likely to be judged dismissing on the AAI. However, other children had also become dismissing, and the chi-square was not significant.

5. Children who were avoidant of their mothers at age 1 strongly tended to be dismissing of attachment on the AAI, although other insecure children had also become dismissing. Here too, therefore, the chi-square test was not significant.

6. As expected, continuous scores for proximity avoidance averaged across the two reunions in the Strange Situation at age 1 predicted the continuous scores for idealization of the mother, as well as insistence on lack of memory, during the AAI.

7. Inflexibility of attention was seen across all three age periods. That is, those participants judged avoidant of their mothers in the Strange Situation also tended in varying ways to focus attention away from attachment-related experiences at ages 6 and 19.

**ASSESSING DISORGANIZED ATTACHMENT STATUS AT AGE 1: ITS EQUIVALENTS AND SEQUELAE AT 6 AND 19 YEARS OF AGE**

The ancient Sumerian epic poem *Gilgamesh*, dating from about 2000 B.C., gives perhaps the earliest illustration of one of the causes of the “frightening” behavior of the parents of infants falling in the fourth Strange Situation category, disorganized/disoriented—that is, unresolved grief:

*Gilgamesh wept bitterly for his friend. . . .*

*He was no more a king*  
*But just a man who had lost his way*  
*Yet had a greater passion to withdraw*  
*Into a deep isolation. Mad,*  
*Perhaps insane, he tried*  
*To bring [his friend] Enkidu back to life*  
*To end his bitterness,*  
*His fear of death. . . .*

*And when [a woman at whose door he knocked] called: Where are you going,*  
*Traveler? And came to see, she saw him as half-crazed.*  
*Perhaps he is a murderer! She thought*  
*And drew away from him in fear.* (Mason [Trans.], 1970, pp. 53–55, 62–63)
This Strange Situation category—“disorganized/disoriented” or “D,”—was first recognized on the basis of our work with the Bay Area sample; it was later expanded via Main and Solomon’s (1990) analysis of 100 low-risk and 100 high-risk dyads. First noticed due to the anomalous or odd nature of their appearance, D behaviors were systematized only following the earlier discovery of their association with unclassifiability in Strange Situation behavior (see Main & Weston, 1981). Some years later, a review of Bay Area Strange Situation videotapes was conducted, and here we reported that “unclassifiable” (as opposed to “classifiable”) infants exhibited a diverse array of inexplicable or overtly conflicted behaviors in the parent’s presence. One unclassifiable infant, for example, cried loudly while attempting to get into her mother’s lap, and then suddenly fell silent and stopped moving for several seconds. Others were seen rocking on hands and knees following an approach; moving away from the parent to the wall when frightened by the stranger; screaming for the parent while separated, and then moving silently away upon reunion; raising hand to mouth in a confused or apprehensive gesture immediately on the parent’s entrance; and while in an apparently good mood, swiping at the parent’s face.

The most striking theme running through these behaviors was “disorganization,” or an observed contradiction or lack of explicability in movement pattern. The term “disorientation” was added to describe behaviors that simply indicated a lack of orientation to the present environment (e.g., trance-like expressions). The title of this third form of insecure Strange Situation response therefore became “disorganized/disoriented.”

In recent years, infant disorganized/disoriented Strange Situation behavior (Main & Solomon, 1990), together with its 6th-year equivalent, D-controlling behavior (Main & Cassidy, 1988), have become among the most closely pursued topics within developmental and clinical research. This upsurge in interest follows on a meta-analysis of studies of D children (van IJzendoorn, Schuengel, & Bakermans-Kranenburg, 1999), which pointed to an impressive relation between disorganized attachment and increased vulnerability to psychopathology. For example, in a finding the author termed “unprecedented,” Carlson (1998) reported that overall psychopathology at age 17 was predictable from the early D classification. Moreover, in keeping with a proposal advanced by Liotti (1992) that infant D attachment would be associated with a vulnerability to dissociation, Carlson also found that children who had been classified as D with their mothers in infancy later showed significantly more dissociative-like behavior as observed by teachers in both elementary and high school, as well as dissociative indices on the Schedule for Affective Disorders and Schizophrenia for School-Age Children. In addition, Lyons-Ruth (1996; see also Lyons-Ruth & Jacobvitz, 1999) discovered that disruptive-aggressive disorders were linked to infant D attachment status with the mother—a finding that has been well replicated.
But why would these anomalous and unpredictable behaviors—most often consisting of very brief interruptions to otherwise “organized” Strange Situation responses—be predictive of an enhanced vulnerability to such dramatic developmental sequelae? As the reader is aware, our proposal has been that these sequelae may emerge out of circumstances for which an infant is not biologically prepared. More specifically, it is a tenet of evolutionary theory that organisms are constrained by the behavioral systems with which they have been phylogenetically (biologically) endowed. Thus it is reasoned that attachment behavior became “universal” within our species as a result of its immediate necessity to survival in our environment(s) of evolutionary adaptedness (for more detailed discussions, see pp. 252–257 as well as Hesse & Main, 1999, 2000, and Hesse, Main, Abrams, & Rifkin, 2003). Therefore, regardless of the nature of any given infant–mother relationship, the mother (or any other primary attachment figure) is the haven of safety that must be approached in times of danger. However, when the infant’s biologically channeled haven of safety has simultaneously become a source of fright, the infant is placed in an irresolvable and disorganizing approach–flight paradox. We have proposed that when this occurs, anomalies in behavior, attention, and reasoning may arise, and (following Liotti, 1992) may ultimately increase vulnerability to disorders involving dissociative processes.

Identifying Disorganized Attachment with the Mother at Age 1: Relations to Maternal and Infant Behavior in Home and Laboratory

Disorganized/disoriented Strange Situation behavior differs from Ainsworth’s two “insecure-organized” attachment categories, in that it represents a breakage or collapse of behavioral patterning, which can occur in conjunction with any of the remaining classifications (including secure). Since by definition no exhaustive list of anomalous (D) behaviors can be created, we delineated seven thematic headings identifying these kinds of Strange Situation responses, each followed by readily fitting behavioral examples. The thematic headings are as follows:

- Sequential display of contradictory behaviors.
- Simultaneous display of contradictory behaviors.
- Undirected, misdirected, incomplete, and interrupted movements and expressions.
- Stereotypies, asymmetrical, or mistimed movements, and anomalous postures.
- Freezing, stilling, and slowed movements and expressions.
- Direct indices of apprehension regarding the parent.
- Direct indices of disorganization, disorientation, and confusion.
Bouts of disorganization sufficient for assignment to the D category can be brief, sometimes lasting just 10–30 seconds. Since these bouts are understood as evidencing a temporary “collapse of behavioral and/or attentional strategy” under stress, a best-fitting alternative secondary placement (e.g., “disorganized/avoidant”) is always assigned as well.

Disorganized behavior has been found to be associated with a variety of constitutional (e.g., neurological or physiological) as well as experiential origins (see Hesse, 1999b). However, in the meta-analytic overview by van IJzendoorn and colleagues (1999), infants who were seen independently with both parents were almost always D with one parent only, while no overall relation between difficult temperament or even severe health problems and D attachment was found among neurologically normal infants. And finally, despite Main’s (1995, 1999) prediction that one would be found, no “family” genetic contribution appears to date in the production of D (or any other) attachment status (Bokhorst et al., 2003).

Because a genetic basis involving infant D attachment status has yet to be substantiated, researchers are continuing to turn to the investigation of potential contributory experiential factors, including any situation in which an infant is frightened by the attachment figure(s). Such situations will, of course, include maltreating relationships—and as first established by Cicchetti (Carlson, Cicchetti, Barnett, & Braunwald, 1989), as well as by Lyons-Ruth (see Lyons-Ruth & Jacobvitz, 1999, for an overview), infant D attachment status is reported in a strong majority (an average of 70%) of maltreated subjects (see also Cicchetti & Barnett, 1991).

However, since disorganization also appears in a notable minority of infants in low-risk samples (averaging 15%, but ranging as high as 30%; see Ainsworth & Eichberg, 1991), Main and Hesse (1990) reasoned that other, perhaps subtler forms of frightening parental behavior could also produce disorganization. Eventually, we concluded that for reasons discussed below, some traumatized but nonmaltreating parents of D infants might sporadically enter into dissociative or quasi-dissociative states (Hesse & Main, 1999). While in these fright-associated states, the parent might exhibit any of the “classic” responses to fear—including freezing (cf. trance), attack (as in quasi-predatory movements), and flight (including subtle indications of propensities to increase distance from the infant, suggesting that the infant is experienced as alarming or dangerous). We and a number of colleagues in other laboratories have in fact observed each of these behaviors in parents in low-risk as well as high-risk samples, and it appears that, like maltreatment, they are associated with infant disorganization. Therefore, we developed a coding system for “frightened/frightening/dissociated” (termed “FR”) parental behavior (Main & Hesse, 1991–1998; see note 11), which has now been utilized in several samples. In each, the “FR system” has predicted infant D attachment (e.g., Abrams, Rifkin, & Hesse, in press; Schuengel, van IJzendoorn, & Bakermans-Kranenburg,
It may be important to add here that aspects of D behavior (especially perhaps as it develops into D-Controlling behavior [see below]), may, like the other forms of insecure infant attachment, ultimately have sequelae that enhance the likelihood of survival in the face of nonoptimal parenting.

**Assessing Disorganization and Its Correlates at 6 Years at the Behavioral and Representational Levels: Indices, and Relations to Early Disorganization with the Mother**

**Sixth-Year Reunion Responses: D-Controlling**

In Main and Cassidy’s (1988) Bay Area study of 6-year-olds reunited with their parents following a 1-hour separation, the great majority of former D infants exhibited role-inverting or “D-Controlling” behavior. Some, described as “D-Controlling-punitive,” ordered the parent about (“Sit down and shut up, and keep your eyes closed! I said, keep them closed!”); others, described as “D-Controlling-caregiving,” were excessively and inappropriately solicitous (e.g., “Are you tired, Mommy? Would you like to sit down and I’ll bring you some [pretend] tea?”). A few actively “clowned” in an apparent effort to entertain and regulate their parents’ state (a behavior pattern seen in repeated clips of the child protagonist clowning and turning cartwheels in an attempt to cheer his depressed mother in Lasse Hallström’s film *My Life as a Dog*). D-Controlling behavior at age 6 was predicted from disorganized infant Strange Situation behavior in our sample—a finding replicated in three further laboratories (van IJzendoorn et al., 1999).

Note that at 6 an unanticipated behavioral transformation had occurred, in that these children were organized in structuring the reunion with their mothers.

**Sixth-Year Responses to Kaplan’s Version of the SAT: D-Fearful**

Overall, Kaplan (1987) described the previously disorganized 6-year-olds seen in her version of the SAT as seeming “inexplicably afraid and unable to do anything about it” (p. 109). These children were therefore termed “D-Fearful,” a category placement that was found to be strongly linked to early disorganized attachment to the mother (Main et al., 1985). Indices of fear included silence and whispering, inexplicable linguistic disorganization (“yes–no–yes–no–yes–no”), and catastrophic fantasies in which the parents or child died.

The association between D-Fearful responses to the SAT and early disorganized attachment to the mother led Kaplan (1987) to speculate that because many D infants had parents who were still experiencing frightening ideation with respect to their own loss experiences (see below), queries
regarding parent–child separations might have had a particularly disorganizing effect on their offspring. In essence, Kaplan was proposing that the children’s fearful fantasies, silences, and disorganized language or behavior in response to queries regarding parent–child separations might have resulted from repeated interactions with parents who were still fearful and confused (in AAI terms, below, “unresolved/disorganized”) regarding an important loss.

The AAI Categories Most Equivalent to Infant Disorganization: Unresolved/Disorganized and Cannot Classify

From the beginning of our AAI research in general, we had noted that among the parents of disorganized infants, speech surrounding important loss experiences in the AAI had anomalous qualities not found during similar discussions held with the parents of infants falling into Ainsworth’s three original Strange Situation categories. By the late 1980s, Main, DeMoss, and Hesse (cited in Main & Goldwyn, 1984) were able to delineate two central ways of speaking about loss (and later, abuse) experiences, which identified what we came to term “unresolved/disorganized” or “U” AAI texts (see Hesse, 1999a, 1999b):

1. Speech usages that seemed to violate a “normal” monitoring of the interview context, as manifested by apparent “absorption” into extreme detail and lengthy and/or inappropriate description. For example, the speaker might discuss the exact position and clothing of each person in a car traveling to a funeral, and then the specific streets taken. Or the speaker might suddenly shift into inappropriate, eulogistic, or “funereal” speech (e.g., “She was young, she was lovely, and she was torn from us by that most dreaded of diseases, tuberculosis”).

2. Speech usages indicating beliefs inconsonant with ordinary conceptions of time–space relations and physical causality. For example, a speaker might state that he or she had “killed” a deceased loved one by failing to think of the person at the moment of death, or describe a deceased individual as both dead and alive in the physical sense (see Hesse et al., 2003; Main et al., 2003).

These speech acts (together with a third U indicator, termed “extreme behavioral response” and rare in low-risk samples) were associated specifically with discussions of potentially traumatic events. They were not uncommon in the texts of speakers who were otherwise readily classifiable as secure-autonomous, dismissing, or preoccupied.

Language usages such as those described above seemed likely to us to originate in anomalous mental states involving dissociated negative emo-
tions or memories. These states of mind might then be indicative of a temporary collapse of mental, attentional, or linguistic strategy (perhaps associated with a fright-induced lapse in working memory; see Main, 1999). We have therefore speculated that such mental states may account for the occurrence of frightened, frightening, or dissociated (FR) behavior in the parents of disorganized infants.

The kinds of discourse “lapses” described above (see also note 25) now lead to placement in the unresolved/disorganized (U) AAI category and are predictive of infant D attachment status. As is the case with infant D attachment, the U classification is always assigned together with a best-fitting secondary category (e.g., U/secure-autonomous, or U/dismissing). In van IJzendoorn’s (1995) meta-analysis of the relations between U parental status on the AAI and infant D status in the Strange Situation with the same parent, the overall effect size was moderate ($d = .65$, equivalent to a correlation of $r = .31$). However, even this moderate relation is surprising, given that assignment to the U (adult) and D (infant) classifications often depends upon only a very few sentences during the AAI, or a few seconds of Strange Situation behavior, respectively.

U placement on the AAI is now considered to be the direct equivalent of infant D attachment status. However, a more recently developed AAI category, “cannot classify” (“CC”; see Hesse, 1996; Minde & Hesse, 1996) may also be expected to predict infant disorganization (as found by Ammaniti & Speranza, 1994). CC status is assigned to an AAI text when, for example, the discussion of a given parent is first dismissed and then becomes an object of preoccupied anger. Hesse has suggested that whereas U status is indicative of the presence of brief and circumscribed bouts of disorganization in speech or reasoning, CC status implies a global disorganization or collapse of a singular or consistent discourse strategy that runs throughout the interview. Thus we anticipated that some former D infants would not “organize” over time, but in the absence of intervening trauma might instead become unclassifiable or CC with respect to the AAI.

In the Berkeley longitudinal study, we therefore predicted that children disorganized with their mothers during infancy would not infrequently be placed in the U category (and occasionally the CC category) of the AAI at age 19. At this point in time, U and CC categories are combined in data reports by most investigators, and hence we collapsed U status with CC status as representing our predicted AAI “outcome variable.”

Unresolved and/or Cannot Classify States of Mind in the AAI as Related to Disorganized Attachment Status at 6 Years of Age and in Infancy

Being classified as D-Controlling on reunion at age 6 approached a trend level ($p = .12$, two-tailed test) in its association with U and/or CC, while
being D-Fearful in the SAT related significantly to U/CC on the AAI. Having been D in the Strange Situation with the mother in infancy was related at a trend level to being judged U/CC at age 19.

However, when we converted our AAI measure to a 3-point scale for U/CC (so that primary U or CC status was assigned a value of 3, alternative placements a 2, and texts insufficient for alternative U or CC placement a 1), the increase in available “range” yielded the following results. First, D-Fearful status on Kaplan’s version of the SAT at age 6 was significantly related to U/CC status on the AAI, while D-Controlling behavior was related at a trend level to U/CC placement ($p = .06$, two-tailed). Finally, being D in the Strange Situation now significantly predicted U/CC status on the AAI (see also Main, 2001).

Because disorganization with the mother is currently considered the strongest index of infant insecurity in terms of attachment, we also ran a simple chi-square testing D versus non-D status with the mother during infancy against adult status on the AAI. Of 15 D infants, 14 were insecure on the AAI, and the relation between simply being disorganized versus “organized” with the mother during infancy and secure-autonomous versus insecure AAI status approached significance ($p = .06$, chi-square, two-tailed). With these results in mind, we also found that 9 out of 10 (90%) of children judged D-Controlling during the 6th-year reunion were insecure on the AAI, as were all 9 (100%) judged D-Fearful on Kaplan’s version of the SAT.

Other Sequelae to Early D Attachment Status

Finally, examination of the 15 AAIs of participants who were D with their mothers at age 1 showed that over half had been judged dismissing, although several were judged U/CC, and one text was now judged secure. This explained the low chi-square results for the sequelae to avoidant attachment status at ages 1 and 6, since while a very strong majority of avoidant children became dismissing, so had many who had initially been disorganized. These latter individuals, then, may have shifted attention inflexibly away from their disorganizing early attachment experiences.

We also compared outcomes for the seven infants judged disorganized/secure with the mother during infancy to outcomes for the eight judged disorganized/insecure. All seven disorganized/secure babies were insecure at 19, and the only disorganized baby judged secure at 19 had in fact been disorganized/insecure at age 1. This result is worth contemplating, given that one might assume a greater resiliency underlying a secondary placement of security in infancy. However, perhaps once fear intervenes to disrupt any organized system, whether the disrupted system was optimal or not becomes of little import. More specifically, if attachment and fear become
intertwined, fear may override all else. In closing this brief section, we
should additionally note that without D coding (often based on just a few
seconds), we would in many cases have incorrectly predicted security on
the AAI.

As this book goes to press, we have learned that using the high-risk
Minnesota poverty sample (n = 125), Weinfield and her colleagues (2004)
have also found that disorganized versus “organized” (both secure and
insecure) status with mother in infancy predicts security versus insecurity
on the AAI at age 19 (p = .03), a result that has replicated at stronger levels
in this same sample at age 26, p = .001 (Sroufe et al., 2005). Surprisingly,
our proportions are similar, with 86% of disorganized children in the Min-
nnesota poverty sample being insecure 18 years later on the AAI, compared
to 93% of former D babies in the Bay Area. Again as in our sample, most
former D infants in Minnesota also became dismissing on the AAI, with the
remaining participants most likely to be classified as U (or, in our sample, U
or CC). Finally, in Minnesota as in Berkeley, disorganized/secure infants
were no more likely than those who had been judged disorganized/insecure
to be secure-autonomous at age 19.

Disorganized/Disoriented Attachment Status: Summary

1. Disorganized (D) attachment has been found to be related to fright-
ening parental behavior, which—because the parent is the infant's biologi-
cally based haven of safety—leads to disorganizing experiences of “fright
without solution” (Hesse et al., 2003; Main & Hesse, 1990).

2. Across multiple studies, infant D attachment status has been found
to be predictive of psychopathology from middle childhood to young adult-
hood, including especially dissociative and externalizing disorders (see
meta-analysis by van IJzendoorn et al., 1999).

3. D attachment status with the mother strongly predicted D-Con-
trolling behavior on reunion following an hour-long separation at age 6, as
well as being classified D-Fearful on the SAT.

4. Almost all D-Controlling and D-Fearful 6-year-olds were insecure
on the AAI at age 19.

5. When U/CC status was converted to a 3-point scale, infant D status
and both of its 6th-year equivalents (D-Fearful and D-Controlling) pre-
dicted their “adult” parallel (U/CC status on the AAI).

6. D versus non-D status in infancy in itself predicted being insecure
versus secure-autonomous on the AAI.

7. D infants who were alternatively secure were no more likely than D
infants who were alternatively insecure to become secure-autonomous on
the AAI. Both this and the preceding result (6) also held for the Minnesota
poverty sample (Weinfield et al., 2004).
8. As in Weinfield and colleagues’ (2004) study, we found a significant tendency for D infants to become U or CC on the AAI at age 19. This result was replicated again in the Minnesota poverty sample at age 26 (Sroufe et al., 2005).

9. Again as in Weinfield and colleagues’ (2004), study we found that more than half of our D infants were insecure-dismissing in their AAI transcripts.

10. Rather than indicating either flexibility or inflexibility in attention, infant D behavior and its adult U and CC equivalents represent local (U) or global (CC) collapses of behavioral, attentional, or linguistic strategy.

**CONCLUDING REMARKS**

Considered in sequence, we have presented, in addition to Ainsworth’s Strange Situation procedure and her three “organized” categories of infant response, four of the methodologies for the assessment of attachment devised in our laboratory. These have included (1) the development of a fourth, “disorganized” infant Strange Situation category; systems for examining (2) real-life and (3) representational processes related to separation at age 6; and finally (4) a life history interview for adults focusing upon attachment. We have summarized the data for each of the three “developmental pathways” that the distribution of infant categories in our sample permitted us to examine—that is, those taken by secure, avoidant, and disorganized infants.

Since this chapter has been constructed so that each attachment category is traced and summarized within its own section, rather than providing a review, we now turn to a few salient topics that have not yet been either directly or fully addressed to this point in the text.

**Interpreting Our Long-Term Outcomes:**

**Stability, Functional Equivalence, and Predictability**

We selected a low-risk, relatively stable sample for our longitudinal study in order to maximize opportunities for tracing lawful sequelae to differing infant “categories of attachment,” should these exist—that is, as part of a search for lawful outcomes in stable circumstances. More specifically, it was our hope to capture and articulate the natural development of individual differences in mind, language, and behavior as a function of childhood attachment relationships.

Prediction, however, may be considered in three ways: “stability” (an outcome almost identical to its precedent, and within the same modality); “functional equivalence” (an outcome mirroring or strongly reflecting its
precedent, but within a different modality); and “pure” predictability per se (an outcome that does not reflect or resemble its precedents, whether or not within the same modality). In other words, simple stability is observing the same thing twice inside a given modality; functional equivalence, more interesting than simple stability, shows the mirroring of a thing across modalities; and “pure” predictability is perhaps the most interesting of all, because there is a presumably replicable transformation in both the form and the modality of the phenomenon. With all this in mind, then, consider that between ages 1 and 6, only two of the six infant response patterns (secure and avoidant reunion behavior) “mirrored” the participant’s earlier behavior (i.e., represented simple stability). However, regarding lawful transformations in the absence of simple stability—that is, functional equivalence and pure predictability—consider the following:

1. The reunion behavior of disorganized infants had become organized (D-controlling) by age 6. This exemplifies pure predictability, being a transformation in both modality and form that has been replicated in further samples (van IJzendoorn et al., 1999).

2. Consider next Kaplan’s (1987, 2003) finding that insecure-avoidant infants who were “affectless” and explored the laboratory room during the separation episodes 5 years later described a pictured child as feeling distress on separation from the parent, but were unable to think what the child could do while separated. Here our observations moved from the nonverbal to the verbal modality. If these children had, as anticipated, lawfully tended to reply that the pictured child would “feel” nothing, but would constructively play or explore, we would have seen an instance of prediction via functional equivalence. However, our previously avoidant infants unexpectedly said that the child would feel distress, but could not think of anything that the separated child could do. This was a reversal of Strange Situation behavior, and hence represents “pure” prediction in the absence of functional equivalence.

In general, whether working with Kaplan’s version of the SAT or with the AAI, what we uncovered as we moved from nonverbal to linguistic processes only sometimes represented functional equivalence. At 19, for example, we did see functional equivalence across time with respect to early disorganization, since brief early episodes of disorganization in nonverbal behavior predicted disorganization in discourse or reasoning within the AAI. However, we also found that internal consistency and collaboration within the text was predicted by secure nonverbal responses to reunion with the mother in infancy—an instance of “pure” predictability, replicating Waters and colleagues (2000) as well as Hamilton (2000).
Despite the impressive predictability in our sample, our study cannot address the question of whether there is a “sensitive period” influencing long-term outcomes, or, in contrast, whether these outcomes are guided by interactions ongoing into adolescence. Questions of this kind can only be investigated in studies that include a substantial proportion of individuals whose life circumstances have been relatively unstable, as in the Minnesota poverty sample. In fact, early versus later influences on functioning in the Minnesota sample showed that when early attachment to the mother was compared to social functioning in middle childhood, early attachment provided the better predictor of long-term social functioning (Sroufe, Egeland, & Kreutzer, 1990).

Let us now consider, however, the absence of long-term predictability specific to attachment in the Minnesota sample when secure versus insecure Strange Situation behavior (as opposed to D vs. non-D behavior, discussed above) was initially used to predict security on the AAI at age 19 (Weinfield et al., 2004). Here, we note that whereas in our study attachment to the mother was stable from 1 to 6 years of age, the Minnesota group found only low, albeit significant, stability in infant attachment to the mother even across a far shorter period (12–18 months; Egeland & Farber, 1984; Vaughn et al., 1979). If, as we assume, (1) when exploring the issue of sensitive periods we are implicitly considering the effects of early experience upon later brain organization with respect to attachment, then (2) we should not expect predictability in any individual whose early attachment-related experiences were markedly unstable. Thus, where no “single” strategy representing any particular attachment-related brain organization is stably evident across the first 18 months, marked predictability to adolescence would hardly be expectable. However, the most recent report from the Minnesota group does show significant stability between security versus insecurity in the Strange Situation at age 18 months and secure-autonomous versus insecure AAI status at age 26 (Sroufe et al., 2005).

**Why Are There Marked Resemblances between Strange Situation Behavior and Linguistic Responses to the AAI?: Accounts via Procedural Memory, Attention, and Emotion**

When participants with intervening trauma were excluded in the Bay Area study, infants’ systematically differing responses to separation from and reunion with their mothers in the unfamiliar laboratory setting often predicted the discourse characteristics of their later discussion of life history. Earlier, we offered the simple interpretation that these similarities emerged out of parent–child interactions that had systematically differed in kind.

We now consider some of the differences in “procedural” memories, attentional processes, and affects that may have helped to account for these
outcomes. More specifically, we explore the possibility that repeated interactions may act to predict discourse during the AAI via the patterning of early actions, affects (see Amini et al., 1996), and attentional processes.

One reason why insecure individuals in particular might “return” to early procedures, routines, attentional processes, or affective states when undertaking the AAI is that its central questions and probes force attention toward early experience and require a rapid succession of speech acts, giving speakers little time to prepare a response. This will enhance the necessity for making rapid action (speech) choices, and will encourage the kind of inflexible, relatively routinized responses seen in previously avoidant infants (and also in ambivalent infants, not studied here). For example, in our study, previously avoidant infants almost from the start of the interview used restriction of attention (and sometimes also response refusal) to “avoid” the topic of early relationships and experiences. In addition, as mentioned above, a significant proportion of infants who had experienced a procedural collapse (disorganization) in the stressful Strange Situation manifested a similar procedural collapse in response to the trauma-related questions in the AAI. In contrast, for previously secure infants, discourse appeared less routinized—a finding consonant with the possibility that most of these participants were able to explore the interview topics in a flexible and relatively relaxed manner, not unlike that observed by Ainsworth regarding a secure infant’s “secure-base” explorations in the home (see Waters et al., 1995). “Earned secure” or “discontinuous secure” texts suggest that, following Amini and colleagues (1996), these speakers somehow have in contrast learned new procedures related to attachment (new action patterns that have become implicit and now guide thinking).

Finally, an “emotional” analysis of the consistencies observed can be considered. With respect to individuals continuous for security, we can infer an underlying confidence and calm. For example, briefly returning to infancy, note that Spangler and Grossmann (1993), who assessed cortisol output following the Strange Situation (cortisol is indicative of preparation for long-term stress), found that even though secure infants often cried during the procedure, their pre- to post-Strange-Situation cortisol rise was exceptionally low. Spangler and Grossmann interpreted this finding as indicative of a (calm) confidence that a well-working “strategy” (i.e., crying and calling) was available for regaining the mother’s presence. Indices that security is also associated with relatively calm emotional states in young adulthood can be taken from the psychophysiological studies conducted by Dozier and Kobak (1992) and from personality Q-sorts obtained from the friends and acquaintances of secure-autonomous college students by Kobak and Scerry (1988). With respect to the association between early avoidance of the mother and the dismissing AAI classification, we have simply to look to the suppression of (overt) expression of negative experience or emotion.
in attachment-related contexts (but see Kobak & Sceery, 1988, for descriptions of hostility observed in dismissing adolescent speakers in other contexts). And, as regards disorganization and its prediction of U/CC status, early behavioral and later linguistic collapses may both involve experiences of temporarily overwhelming fright.

Emotion, attention, and procedural memories are, of course, not mutually exclusive (see Amini et al.’s [1996] emphasis upon affect as well as memory). All three must be mutually influential, all effect narrative, and all three have no doubt contributed to the continuities observed.

Is Stability Enhanced through Attempts by Parents in Insecure-Organized States of Mind to Maintain a State of “Felt Security” with Respect to Their Own Primary Attachment Figures?

In papers first circulated at the University of Virginia in 1985 (see also Main, 1995), we suggested that many parents whose AAI texts are placed in insecure-organized categories may (1) implicitly act to encourage their infants to assist them in maintaining their present (insecure) states of mind, either by (2) specifically discouraging attachment behavior, a form of behavior that may raise anxiety for insecure-dismissing parents, or else by (3) discouraging autonomous/exploratory behavior, which may raise anxiety for insecure-preoccupied parents.

In other words, both infant “attachment” behaviors and infant “independent” exploratory behaviors may threaten to lead dismissing or preoccupied parents away from the state of mind that had seemed optimal for maintenance of the relationship to their own parents during childhood, and hence may still create feelings of anxiety. As one example, being faced with infants’ crying and proximity seeking could create feelings of anxiety in parents who had “learned” that inhibiting attachment behavior (minimizing relatedness under stress) was the best strategy for maintaining relationships with their own parents. Thus, insofar as it serves to minimize attachment displays, the rejection of infant attachment behavior may help parents who produce dismissing AAI texts to maintain their historically desired, and currently “working,” state of mind. The same argument could hold for parents who produce preoccupied texts, for whom independent exploration as well as autonomous gestures they had displayed as young children may have led to anxiety for their own parents, and produce anxiety if exhibited by their own infants.

Thus, a sense of “false but felt security” may be preserved via maintenance of any mental state that originally allowed some continued proximity to the parents’ parents, and be threatened by any infant behaviors so
inconsonant with that mental state as to potentially alter it. At another level, of course, insofar as the infant begins to respond by behaving like the parents’ parents, both “rejecting” and unpredictable, “autonomy-discouraging” parents may find the repetition of their own parents’ behavior by their offspring distressing.

Finally, we may speculate that various kinds of “insensitive” behavior, at least for some insecure parents, act to preserve the original tie to their own parents, and that—because their state of mind has yet to become autonomous—this may in fact remain their primary tie.

“Looking Backward” from Late Adolescence to Infancy and Early Childhood: What Can We Learn from a Longitudinal Study?

The value of prospective studies in attachment—first suggested by John Bowlby—is now well recognized, and in the present chapter we have for the most part presented our data via this prospective path. Here, we look briefly at our data from a retrospective vantage point.

Expected Findings and Their Implications

A majority of secure-autonomous AAI texts in our study came from individuals with apparently secure backgrounds, while the majority of insecure texts were produced by individuals whose childhoods appeared to have been insecure. These were both expected findings. If sufficient replications of our study are forthcoming, researchers who need to employ the AAI in the absence of earlier attachment measures may have some confidence that for a majority of AAI participants without intervening trauma, they are assessing a stable phenomenon. The likelihood of replication will of course be increased where sample selection is similar to ours, and where coders are trained to comparable levels of expertise.

Another expected finding was that CC status on the AAI had some association with infant disorganization, as well as the mothers’ unexplained fears for the death of the (child) participant. These findings appear to support the notion that such texts do come—as Hesse (1996) has proposed—from frightening interactions with a primary attachment figure.27

Unexpected Findings and Their Implications

Most researchers are inclined to expect that when trauma changes security status, it will “move” a secure individual into insecurity. A first unexpected finding, then, is the case mentioned earlier, in which a traumatic event in
fact appeared to lead an adolescent who had been insecure in infancy and at 6 to secure-autonomous AAI status.

Another informative and unanticipated finding comes from an additional single case—a child who appeared to us to be exceptionally robust, self-confident, and high-spirited in free-play observations made in infancy and at age 6, and had been coded as secure with both parents at both time periods. However, at 19, following an intervening trauma, this participant’s text was coded as unresolved/preoccupied—meaning that the adolescent not only “lapsed” while discussing a frightening event, but also discussed the parents with whom there had been security for the first 6 years in a manner indicative of strong insecurity. This outcome was especially surprising, because the form of speech usage leading to this particular preoccupied category placement (“passive/vague discourse”) is very rare. We had presumed that speech of this kind would stem from a background of extreme early insecurity, probably including neglect.

These are, of course, only single cases. In addition, we found that quite a few 19-year-olds producing dismissing texts came from disorganized (hence probably frightening) backgrounds, as opposed to rejecting backgrounds (as imagined). This has been discussed in detail earlier in the text. Nevertheless, it is important to remember that it was an entirely unexpected yet systematic outcome, and is virtually identical to Weinfield and colleagues’ Minnesota outcomes.

The assumption that individuals sharing the same present attachment classification are “now” the same (or at least highly similar), whatever their differences in history, is widespread. Of course, an individual’s AAI text, insofar as it leads to a particular classification, does imply certain important similarities with others in that same classification. We would argue, however, that this “retrospective” examination of our data has not only emphasized that individuals with the same AAI classification can differ sharply in earlier experience, but also that those alike in AAI classification but differing in early experience may soon be found to differ as well in neurophysiological and brain organization (see also Main, 1999). Moreover, note that our discontinuous unresolved/preoccupied text came from a speaker who may later reveal unexpected resiliency, while some dismissing texts may come from individuals with continuing but as yet unrevealed vulnerabilities to trauma.

Among the many current investigations utilizing the AAI, some now involve psychophysiology and neuroimaging. In these and other similarly complex and intensive investigations, it will be particularly important to bear in mind that those assigned to the same adult attachment classification may well differ in lawful ways, depending on whether this classification is or is not consonant with early attachment organization and early attachment-related states of mind.
This chapter is dedicated to the memory of Fariboz Amini, MD (1930–2004), whose 1996 article influenced our thinking regarding the mediators of the long-term effects of early attachment relationships. For support of the studies described here, we are grateful to several foundations and fellowships. First, following the kind intervention of Klaus and Karin Grossmann, Lotte Kohler and the Kohler-Stiftung Foundation of Munich provided the initial funds for the 19th-year follow-up study, as did the American Psychoanalytic Foundation. A Guggenheim Fellowship to Mary Main assisted with the development of our methods, and the study was further supported by the William B. Harris Foundation of Chicago, the William T. Grant Foundation, and the Amini Foundation for the Study of Affects. We are grateful to Jude Cassidy, Carol George, Ruth Goldwyn, Judith Solomon, Ellen Richardson, and Donna Weston for their assistance with early phases of this project. Jennifer Ablow and Daniel Silver conducted the Adult Attachment Interviews for the most recent follow-up study; Isabel Bradburn analyzed them; Kazuko Behrens assisted with data analysis; and Wanda Bronson, Pehr Granqvist, Siegfried Hesse, Sarah Hrdy, Deborah Jacobvitz, Joan Stevenson-Hinde, and Marinus Van IJzendoorn provided conceptual, technical, and terminological improvements to this manuscript. We thank the then-11-year-old David van IJzendoorn for the extraordinary technological expertise and assistance he and his parents provided in Leiden prior to our trip to Regensburg, and Marinus van IJzendoorn for acting as our discussant.

NOTES

1. Only two “insecure-ambivalent/resistant” infants were available; hence their trajectories could not be traced.
2. Recently, attention has been drawn to the positive role played by the attachment figure’s “mind-mindedness” in the development of infant security. However, it should be noted that from its inception Ainsworth’s sensitivity scale had included the mother’s capacity to reflect upon and acknowledge the infant’s mind (see Main, 1999).
3. For readers who are less familiar with idiomatic U.S. English, the term “being a pill” is a light term of nonendorsement of the behavior patterns currently shown by another person, often a child.
4. Again for readers who may need clarification, this is a contraction for the very young of the more adult usage, “an expression.”
5. Mary Ainsworth would not think of or countenance asking mothers to visit her laboratory without a full and friendly visit and description of the procedures in the comfort of their homes.
6. Not all outcomes of conflict appear anomalous; for example, grooming behavior can be a normal-appearing form of “displacement.”
7. As used here, “heritable” refers to variations in genetic makeup originating in the parents of some, but not other, individuals within a given species. Attachment is not considered “heritable” in this sense, because all individuals and their ancestors in the same species are born equipped with this same “behavioral program.”
8. Even less than an hour of social interaction with a consistent caregiver per day may facilitate the formation of an attachment. Moreover, attachments are as readily formed to abu-
sive caregivers as to others. Thus the nature of the interaction is not as critical as that it originates consistently from a particular person.

9. Note, however, that studies of infants raised without any consistent caregivers indicate that the ability to form attachments may decrease by the end of the third year of life.

10. Humans evidently have these associated inhibitory capacities, whereas, for example, in rhesus monkeys, “organized” avoidance (as opposed to simple flight) appears yet to be observed.

11. Training in assessing disorganized attachment from videotapes is available each summer at the Institute of Child Development at the University of Minnesota (contact Elizabeth Carlson at 612-626-8668). Training in the Adult Attachment Interview is available in six or more institutes per year worldwide (contact Mary Main or Erik Hesse at the Department of Psychology, University of California, Berkeley, CA, 94720, or else fax 510-642-5293 for a list of certified trainers and their contact numbers). Use this fax number also for inquiries regarding training in the 6th-year system held at Berkeley, Main and Hesse’s “FB” coding system and Kaplan’s training in her version of the SAT. Inquiries regarding the latter trainings can be addressed to us at the Department of Psychology, or else, again, faxed to us at 510-642-5293.

12. For example, our method for estimating a child’s attachment status in infancy from family drawings with the mother (developed by Kaplan & Main, 1986) has been replicated in the Minnesota poverty sample (Fury, Carlson, & Sroufe, 1997), in Regensburg (Grossmann & Grossmann, 1991), and at the University of Maryland (J. Cassidy, personal communication, 1987).

13. The size of this group (n = 40), selected at random beyond the relatively even groups representing infant attachment to the mother, obviously contrasts sharply with the numbers of families actually available to us. This was due to Mary Ainsworth’s recommendation to Mary Main to select for any intensive and pioneering study a group of persons no larger than could be comprehended, remembered, and thought through, both at the time of data collection and over succeeding years. With respect to her own selection of 26 infant–mother dyads for intensive study (in both Uganda and Baltimore), she had said that this was just about the size of most hunter–gatherer troops, and hence probably represented the number of other people that a person could naturally come to understand.

14. Fewer secure children than would have been representative of the sample were returned to the laboratory, because of our special interest in the sequelae to early insecurity, especially early disorganization.

15. Continuous score configurations are usually sufficient for singular category placement, but when scores indicate directly contradictory category placements, Hesse’s (1996) “cannot classify” category is considered.

16. However, as is the case with the algorithm for category assignment from our continuous scales developed by Waters (Waters, Treboux, Fyffe, & Crowell, 2001), this “bottom-up” approach is insufficient to move beyond the five major categories of the AAI to the 12 subcategories, which are also of special interest. Here the top-down approach remains necessary.

17. The Grossmanns’ AAI report, however, rested not on the method of AAI analysis developed in our laboratory, but rather upon Roger Kobak’s Q-sort analysis (Kobak, 1993), a system derived from but by no means identical to ours. However, as we understand it (K. E. Grossmann, personal communication, 2002), the Main and Goldwyn (1984–1998) method fared no better in predicting AAI responses from infancy.

18. Our sample was young and, as noted above, contained no “earned secure” transcripts. Therefore, coherence was of course strongly associated with scores for maternal loving. In samples containing a high proportion of “earned secure” texts, the relation between maternal loving and early security would ideally be recomputed, controlling for relations between security and coherence.
20. Some avoidant infants do, however, attend to and appear to enjoy the presence of the stranger.
21. For AAI matches to 1st-year and 6th-year avoidance here, we were using a three-way analysis. When we used a five-way analysis, two adolescents received “cannot classify” designations, with dismissing as the first alternative.
22. These are the only two continuous AAI scores that could be linked to early avoidance of the mother in this sample, since “fear of loss of the child” (associated with dismissing placement in parents) could not be used with adolescent college students, and “derogation” (also associated with the dismissing category) is rare in low-risk samples.
23. Maintenance of self-organization as an adaptive or biological function of avoidance had been suggested for the nonhuman context both by Michael Chance (1962) and—albeit less directly—by Niko Tinbergen (Tinbergen & Moynihan, 1952).
24. During her year in Bielefeld, Main (1977) was already assigning some of the Grossmanns’ middle-class infants to a new code (“N.T.C.” or “not to classify”).
25. Lapses in the monitoring of (1) discourse or (2) reasoning are by far the most frequent indices of unresolved/disorganized states of mind as seen in the AAI. A third, very rare response (which also leads to unresolved/disorganized category placement) is seen in reports of “extreme behavioral reactions,” including especially suicidal attempts and/or psychiatric hospitalization following a loss.
26. It would go beyond the bounds of this chapter to present this theory at its fullest. However, it is most likely (as Ainsworth suggested in a letter to Main) that dismissing parents not only attempt to obtain their infants’ cooperation in maintaining their own “safest” state of mind via rejection, thus creating avoidance, but also are simultaneously dismayed by it, since avoidance mimics the rejection they may have earlier experienced.
27. However, others came from secure backgrounds (and were coded unresolved/secure), and two coded as CC had been avoidant as infants but had mothers who had feared their deaths without being able to trace this fear to any source. Insofar as we are aware, the infant–mother interaction pattern for this rare dismissing subcategory (Ds4, “fear of loss from an unknown source”) has yet to be ascertained, but may well be frightening.

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