

The Stability of Attachment Security from Infancy to Adolescence and Early Adulthood: General Introduction

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Current attachment theory hypothesizes that attachment security during infancy influences individual differences in adult representations of attachment. We present three long-term longitudinal studies using three different samples relevant to this hypothesis. Each study assesses infant attachment by using the Ainsworth Strange Situation and adult attachment by using the Berkeley Adult Attachment Interview (AAI). Attachment security was significantly stable in the first two studies. Discontinuity in all three studies was related to negative life events and circumstances. Comparison of the results across these complementary studies affords a degree of replication and sheds light on alternative interpretations. Various mechanisms underlying the stability and instability of attachment security are discussed.

INTRODUCTION

The role of early experience in later development is an enduring issue in developmental psychology. This issue is of theoretical and clinical interest and, in important respects, defines the relation of developmental psychology to the social, personality, and clinical psychology of adulthood. Developmentalists today generally agree that infants can meaningfully engage, experience, influence, and represent their environments (e.g., Mehler & Dupoux, 1993; Sroufe, 1997). They also agree that characteristics of both individuals and environments can be coherent over time. Thus theory and research agree that developmental change is both coherent across time and open to environmental influences (e.g., Ainsworth & Marvin, 1995; Lewis, 1997; Sroufe, 1979; Sroufe & Rutter, 1984; Waters & Sroufe, 1983). Just as few developmentalists would say that early experience is never important, few would say that it ever guarantees long-term developmental outcomes or inoculates against subsequent trauma or deprivation (Sameroff & Chandler, 1975; Sroufe & Jacobvitz, 1989).

Despite this hard-won consensus, much about the importance of early experience, the stability of individual differences, and the role of individual and environmental variables in specific areas of cognition, behavior, or emotion is domain specific. The general principles are clear. But for any area of cognition, behavior, or emotion, the specifics depend on formulating and testing causal hypotheses and integrating domain-specific hypotheses with general ideas about early experience.

Attachment theorists have made important contributions to current views of early experience and individual differences. The secure base relationship in

to context and, although available across a wide range of situations and across age, its operating characteristics remain open to revision in light of significant new experiences (Bowlby, 1969; Waters, Kondo-Ikemura, Posada, & Richters, 1991). Bowlby (1969, 1973) hypothesized that early relationship experience with the primary caregiver leads eventually to generalized expectations about the self, others, and the world. Cognitive representations of these expectations are referred to as "working models." Although such representations emerge early in development, they continue to evolve in light of attachment-related experiences during childhood and adolescence (Bowlby, 1973; Bretherton, 1990; Oppenheim & Waters, 1995).

Bowlby's (1969) hypotheses about infant and adult attachment have generated a great deal of research on secure base behavior in infancy and attachment representations in adulthood; it is only now becoming possible to conduct long-term follow-up studies to examine his ideas about consistency and change from childhood to early adulthood. The accompanying studies examine relations between infant attachment classifications and attachment representations in early adulthood. These studies share several goals. The first is to provide descriptive information about the stability and change in attachment organization from infancy to late adolescence/ early adulthood in a variety of developmental contexts. As Fox (1995) has noted, such data are important points of reference for ongoing controversies in attachment research. The second goal is to determine whether stressful attachment related life

ment organization over this interval. As Vaughn, Egeland, Sroufe, and Waters (1979) emphasized, change per se does not contradict Bowlby's theory. One of Bowlby's most important departures from classical psychoanalytic theory was his emphasis on actual (as opposed to fantasized) experience. For attachment organization to persist despite significant attachment-related experiences would present a major challenge to this formulation. The third goal of the accompanying studies is to stimulate discussion and research on the mechanisms underlying stability and change in attachment representations. A number of developmentalists (e.g., Belsky, Campbell, Cohn, & Moore, 1996; Carlson & Sroufe, 1995; Sroufe & Jacobvitz, 1989; van IJzendoorn, Juffer, & Duyvesteyn, 1995) have emphasized the importance of developing models to guide longitudinal research on these issues and the difficulty of doing so without initial empirical

SAMPLES, DESIGNS, AND SHARED MEASURES

Each of the following studies employs a similar design: they assess attachment in infancy and attachment representation in young adulthood. The first study (Waters, Merrick, Treboux, Crowell, & Albersheim, 2000) presents findings on a sample of young adults reared in middle-class families. The second study (Hamilton, 2000) includes families participating in a longitudinal study of alternative family lifestyles. This unique sample provides important information about the extent to which the results of the first study might be specific to middle-class samples. The third study (Weinfield, Sroufe, & Egeland, 2000) reports on a sample of extremely disadvantaged families who experienced rates and types of stressful life events far beyond anything encountered in the other two samples. This study is important for at least two reasons. First, the sample itself places research on predominantly middle-class samples in a useful context. Second, it provides useful information about the vicissitudes of stressful life events and their impact on attachment.

In addition to sharing similar designs, each of the following studies used the Ainsworth Strange Situation to assess attachment security in infancy and the Berkeley Adult Attachment Interview (AAI) to assess attachment security in early adulthood. For economy, we outline the procedures and scoring systems for these familiar measures here rather than repeating them in each study.

Ainsworth Strange Situation. "Security" is a key construct in attachment theory (Waters and Cummings, 2000). A secure infant is able to use one or a few at-

tachment figures as a secure base from which to explore and as a haven of safety in retreat and is confident in this person's availability, responsiveness, and competence to serve as a secure base. This secure base phenomenon is best assessed by direct observation across time and context in naturalistic settings. Unfortunately, such observation is time-consuming and difficult to do well. Ainsworth, Bell, and Stayton (1971, p. 37), Ainsworth, Blehar, Waters, and Wall (1978, p. 242), and Vaughn and Waters (1990) have demonstrated that we can make strong inferences about the everyday secure base behavior of home-reared middleclass U.S. infants from their behavior in a brief series of separations and reunions in the laboratory. The Strange Situation consists of eight episodes: mother-child free-play (Episodes 1, 2, 3), experimenter-child free play (Episodes 3, 6), separation from mother (Episodes 4, 7), and reunion with mother (Episodes 5, 8). On the basis primarily of response to the mother during two reunion episodes, infants are classified as secure (i.e., confident in mother's availability and responsiveness), insecure-avoidant, or insecure-resistant. In middle-class U.S. samples, approximately 65% to 75% of home-reared 1-year-olds are classified secure. Both the proportion of infants who cry and the proportion of infants classified secure versus insecure have been shown to differ within and across cultures.

All *secure* infants greet or approach the mother on reunion; if upset or crying they are comforted by physical contact, holding and interaction with the mother; they do not avert gaze, show signs of anger, or seek to be put down before they are ready to return to play. Their play returns to pre-separation levels by the end of the episode. *Insecure-avoidant* infants are less likely to cry in response to separation; they are identified primarily by failure to greet the mother, aborted approaches, or ignoring the mother early in the reunion episode. Such avoidance tends to increase rather than decrease from the first to the second reunion. *Insecure-resistant* infants (sometimes referred to as ambivalent) are very likely to cry during the separation episodes. When the mother returns they often continue to cry; they often look at and reach for the mother with little or no active approach. When picked up, they do not actively cling and are not easily comforted. If the mother offers a toy they often show continued distress by slapping at it or at her but this is not accompanied by active turning in or by clinging. They frequently stop crying only to start again if the mother puts them down to play. An additional classification of insecure disorganized/disoriented (Main & Solomon, 1986) is not included in the present studies because the infant assessments

were conducted before this pattern was described and validated.

As predicted by Bowlby-Ainsworth attachment theory, sensitive maternal care and related behaviors throughout infancy are consistent correlates of the "secure" Strange Situation classification (Ainsworth et al., 1978; DeWolff & van IJzendoorn, 1997; Posada et al., 1999). Lamb, Thompson, Gardner, and Charnov (1985) summarize a wide range of attachment- and competence-related correlates that lend support to the validity of the Strange Situation classifications as a measure of attachment security. Finally, the secure versus insecure classification has good discriminant validity vis-avis both cognitive developmental level (Ainsworth et al., 1978) and temperament (Sroufe, 1985).¹

The validity of the Strange Situation in any population or culture rests on its relations to patterns of secure base behavior over time and contexts in naturalistic settings (Ainsworth et al., 1971, p. 37; Ainsworth et al., 1978, p. 242; Vaughn & Waters, 1990). There may well be populations in which the Strange Situation does not map closely onto secure base patterns in daily life. In such circumstances valid assessment is always possible by means of direct observation of secure base behavior as in Ainsworth's Baltimore longitudinal study (Ainsworth et al., 1978) or recent studies using the Attachment Q-set (e.g., Waters & Deane, 1985; Waters, Vaughn, Posada, & Teti, 1999). Bowlby-Ainsworth attachment theory does not depend on the Strange Situation working equally well in every population. It does, however, depend on our evaluating its validity before using it in new contexts. When this is done, studies of attachment stability and cultural differences in rates of secure versus insecure attachment across cultures can only enrich attachment theory. When we can rule out measurement failures, population differences can be important clues that direct attention to (1) cultural or ecological differences in caregiver behavior, (2) ecological adaptations in the way secure infants use caregivers, or (3) cultural or ecological specificity in the relation between caregiver

behavior and infant secure base behavior. With close attention to the reliability and validity of caregiving and secure base assessments, cross-cultural research can make a significant contribution to our understanding of the development and function of secure base behavior (Waters and Cummings 2000).

Berkeley Adult Attachment Interview. Bowlby proposed that with age and cognitive development, sensorimotor representations of secure base experience give rise to internalized mental representations through a process in which the child constructs increasingly complex internalized representations of the world and of significant persons in it. The relative safety or danger of a situation and the availability and responsiveness of significant attachment persons are not appraised afresh every time; rather, an organized pattern of internalized representations (including affective as well as cognitive components) both within and outside of conscious awareness organizes information relevant to attachment experiences and feelings and guides behavior in new situations (Bretherton, 1985; Main, Kaplan, & Cassidy, 1985).

In an effort to capture a generalized representation of attachment, Mary Main and her colleagues developed a semistructured interview about childhood attachment relationships and the meaning that the individual currently gives to past experiences in these relationships (George, Kaplan, & Main, 1985, 1996). The narrative is examined for material purposely expressed by the individual and for material the individual seems unaware of, for example, apparent incoherence and inconsistencies of discourse, thus aiming to assess elements of attachment representations which are not conscious. The scoring system (Main & Goldwyn, 1985-1995) is based upon (1) descriptions of childhood experiences, (2) language used in the interview, and (3) ability to give an integrated, believable account of experiences and their meaning. The language and discourse style used is considered to reflect the individual's state of mind with respect to attachment.

Individuals classified as *secure* coherently and believably describe diverse childhood experiences, value attachment relationships, and view attachment-related experiences as influential in development. Adults are classified as *insecure* on the basis of incoherence in the interview. Adults classified as *dismissing* deny or devalue the impact of attachment relationships, have difficulty with recall of events, often idealize experiences, and often describe an early history of rejection. Adults classified as *preoccupied* display confusion about past experiences, and their discussions of parental relationships are marked by active anger or by passivity and continued attempts to please parents.

¹ Although the weight of available evidence supports the secure base interpretation of secure versus insecure Strange Situation classifications, relations between attachment and temperament deserve further study. Unresolved issues include (1) the effect of infant temperament on maternal sensitivity; (2) the effect of "fit" between infant and maternal temperament on maternal sensitivity; (3) the role of maternal care on the consolidation of temperament-like characteristics; (4) the relation of positive affect, temperament, and attachment behavior in the Strange Situation and at home; (5) the nature of individual differences within secure and insecure groups; and (6) the possibility that temperament influences an infant or child's perception of and response to intrusive care (Seifer & Schiller, 1995). Resolving these issues could help clarify mechanisms that underlie both stability and change in attachment security.

An additional classification, unresolved with respect to loss of a family member or significant relationship or abuse at the hands of a parent or primary caregiver (U), is assigned if a subject's discussion of these specific events is judged incoherent. Subjects are assigned both a secure/preoccupied /dismissing classification and, if applicable, the unresolved classification. In the present studies, comparisons with the three Strange Situation groups were based on the subjects' secure/preoccupied/dismissing AAI classification. When AAI classifications are dichotomized (secure versus insecure), any secure adults who received a U classification are designated insecure.

AAI classifications have been shown to be highly stable in a number of short-term test-retest studies (see Crowell & Treboux, 1995; Sagi, van IJzendoorn, Scharf, Koren-Karie, Joels, & Maysel, 1994). Several types of data support the attachment working model interpretation of the AAI. For example, Gao, Waters, Crowell, and Treboux (1997) have shown that AAI classifications are significantly related to engaged adults' ability to both use and serve as a secure base for their partner during discussions of relationship problems. The strong concordance between maternal AAI and infant attachment security (Main et al., 1985; Posada, Waters, Crowell, & Lay, 1995; van IJzendoorn, 1992) is also relevant to the measure's validity. Studies have also demonstrated substantial predictive, concurrent, and retrospective correspondence between parents' mental representation of attachment as assessed by the AAI and their infants' attachment security as assessed in the Strange Situation (e.g., Fonagy, Steele, & Steele, 1991; Main et al., 1985; van IJzendoorn, 1992; see Crowell & Treboux, 1995, for a review). The discriminant validity of secure versus insecure AAI classifications has been established *visa-vis* IQ, cognitive style, narrative style, general adjustment, and a variety of personality trait variables (Bakermans-Kranenburg & van IJzendoorn, 1993; Crowell et al., 1996).²

Negative life-events. In the studies presented here we identified a core set of life events derived from the theoretical and empirical literature that would be expected to influence the stability of attachment directly

² As with the Strange Situation, there appear to be cultural and subcultural differences in the proportion of subjects classified secure versus insecure. Such differences are difficult to interpret. The English syntactic, semantic, and pragmatic cues used to score the AAI cannot be translated directly to another language. Nor is there an accepted criterion comparable to infant secure base behavior that can validate, and if necessary stand in for, the AAI in crosscultural research. This is a significant obstacle to research on the generalizability of research with the AAI.

by altering the child-parent relationship and indirectly by increasing life stress for the parents. These events, identified by Bowlby (1953), included the death of a parent, foster care, parental divorce, chronic and severe illness of parent or child, single parent, parental psychiatric disorder, drug and alcohol abuse, and child experience of physical or sexual abuse. In the Waters et al. (2000) study negative life events were scored from the AAI and by checklist in early adulthood; Hamilton (2000) and Weinfield et al. (2000) assessed negative life events prospectively from measures administered during their longitudinal studies.

The purpose of these life event assessments was to test the hypothesis that changes in attachment organization are not random but rather are related to events that bear on the caregiver's availability and responsiveness. These are complex issues. They cannot be addressed in a single study or a single research design. The present studies establish some of the key parameters of attachment stability and change from infancy to early adulthood. They are a necessary first step toward understanding the mechanisms that explain stability and change across such intervals.

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Attachment Security in Infancy and Early Adulthood: A Twenty-Year Longitudinal Study

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Sixty White middle-class infants were seen in the Ainsworth Strange Situation at 12 months of age; 50 of these participants (21 males, 29 females) were recontacted 20 years later and interviewed by using the Berkeley Adult Attachment Interview (AAI). The interviewers were blind to the participants' Strange Situation classifications. Overall, 72% of the infants received the same secure versus insecure attachment classification in early adulthood, $\kappa = .44$, $p < .001$. As predicted by attachment theory, negative life events—defined as (1) loss of a parent, (2) parental divorce, (3) life-threatening illness of parent or child (e.g., diabetes, cancer, heart attack), (4) parental psychiatric disorder, and (5) physical or sexual abuse by a family member—were an important factor in change. Forty-four percent (8 of 18) of the infants whose mothers reported negative life events changed attachment classifications from infancy to early adulthood. Only 22% (7 of 32) of the infants whose mothers reported no such events changed classification, $p < .05$. These results support Bowlby's hypothesis that individual differences in attachment security can be stable across significant portions of the lifespan and yet remain open to revision in light of experience. The task now is to use a variety of research designs, measurement strategies, and study intervals to clarify the mechanisms underlying stability and change.

INTRODUCTION

One of Bowlby's primary goals in developing modern attachment theory was to preserve what he considered Freud's genuine insights about close relationships and development. These included insights about (1) the complexity of social, cognitive, and emotional life in infancy, (2) underlying similarities in the nature of close relationships in infancy and adulthood, and (3) the importance of early experience.

To preserve these insights, Bowlby recast Freud's insights in terms of control systems and ethological theories. He also placed his own imprint on them by replacing cathexic bonding with evolved secure base patterns as the common thread in infant and adult relationships. He also placed greater emphasis on the openness of early relationships to change, especially in light of real-life experiences.

Ainsworth's observational studies of secure base behavior at home and in the laboratory (Ainsworth, Blehar, Waters, & Wall, 1978, Ch. 4, 5, 13) initially focused on normative trends in infants' responses to novelty, separation, and reunion. Her goal was to test the appropriateness of Bowlby's control systems model of infant behavior toward a caregiver. Subsequently, individual differences designs proved useful for examining the determinants and developmental

significance of secure base behavior (Ainsworth et al., 1978, Ch. 7, 8, 14; Colin, 1996).

Working within Mischel's (1968) critique of the individual differences paradigm, Masters and Wellman (1974) examined intercorrelations and stability in several studies of infant behavior in brief laboratory separations. They concluded that, consistent with Mischel's (1968) situationist critique of the individual differences paradigm, there was little evidence of consistency in correlations across discrete "attachment behaviors" or of stability over intervals of weeks, days, or minutes. These conclusions carried considerable weight.

The present study began (Waters, 1978) as an effort to clarify issues raised by the Masters and Wellman (1974) review. Strange Situation data were collected on a middle-class sample at 12 and 18 months of age. In each episode, we counted the frequency of discrete "attachment behaviors" and rated key interactive behaviors (proximity seeking, contact maintaining, proximity and interaction avoiding, and contact resisting). In addition, we classified each infant as secure, insecure-avoidant, and insecure-resistant at each age. Reliability analysis indicated that most of the discrete behaviors examined in the Masters and Wellman (1974) review were far too rare to enable us to obtain a reliable estimate of an infant's typical behavior from brief episodes. That is, measurement failure could explain much of the negative evidence compiled by

This is one of three long-term longitudinal studies assessing infant attachment. See Waters, Hamilton, & Weinfield, "The Stability of Attachment Security from Infancy to Adolescence and Early Adulthood: General Introduction," for an overall view of study design, measures, and supporting references.

Masters and Wellman (1974). This interpretation was strengthened by evidence that stability across episodes and across time was much higher with the broader (and thus more reliable) rating scales and classifications. These results addressed the Masters and Wellman critique in detail and, in doing so, buttressed an emerging methodological defense of individual differences research (e.g., Block, 1977; Epstein, 1978). As a result, they too carried considerable weight.

Lacking attachment security measures that could be applied beyond infancy, few if any researchers in the mid-1970s planned long-term follow-up assessments. This obstacle was overcome with the development and validation of the Berkeley Adult Attachment Interview (Main, Kaplan, & Cassidy, 1985; see Crowell & Treboux, 1995, for a review). As Vaughn, Egeland, Sroufe, and Waters (1979) note, Bowlby's theory predicts that secure base use and attachment representations are significantly stable across time and yet open to change in light of significant attachment-related experience. The goal of this follow-up study was to examine the extent of stability and change in attachment patterns from infancy to early adulthood and to stimulate research into the mechanisms underlying these developmental

METHOD

Participants and Procedure

Sixty 12-month-olds recruited from newspaper birth announcements in Minneapolis and St. Paul were seen in the Ainsworth and Wittig Strange Situation in 1975 and 1976. Most also participated in a 6-month follow-up at 18 months of age (see Waters, 1978). Fifty of these participants (21 males, 29 females) were relocated 20 years later and agreed to participate in the Berkeley Adult Attachment Interview (George, Kaplan, & Main, 1985). Their ages at the time of the AAI were from 20-22 years. As was true for their families in the original study, their socioeconomic status spanned the lower- to upper-middle classes. Living arrangements were diverse: 45% lived at college, 24% at home, 24% independently, 6% in other arrangements (e.g., military). Seventy-two percent described their primary occupation as "student"; 18% had completed high-school and were now employed; 4% had completed college and were now employed; 6% did not mention employment. In most instances (78%) the participants' parents had remained married. Two participants lost a parent before age 6. Two participants had a child of their own.

Infant attachment assessment. Each participant was seen in the Ainsworth Strange Situation at 1 year of

age. They were classified as secure, insecure-avoidant, or insecure-resistant, as described in Ainsworth et al. (1978). The insecure disorganized classification (Main & Solomon, 1986) was not yet developed when we scored these tapes. Independent coders assigned infant attachment classifications at 12 and 18 months. Each participant was classified by two independent coders; eighteen-month data were scored without the knowledge of 12-month classifications. Raters agreed on major classifications in 45 out of 50 (90%) of the cases (see Waters, 1978). Disagreements were resolved by conference. The distribution of attachment classifications at 12 months was 29 (58%) secure, 12 (24%) insecure-avoidant, and 9 (18%) insecure-resistant.

Adult attachment assessment. Adult attachment status was assessed by using the Berkeley Adult Attachment Interview (George et al., 1985) when each participant was from 20 to 21 years of age. Administration and scoring procedures are summarized in the General Introduction and detailed in Main and Goldwyn (1994). The interviews were conducted by three of the authors. Thirty-seven interviews were conducted in a private room provided by a community library; three participants were interviewed in their parents' homes. We interviewed 10 participants by telephone, nine who had moved away from the Minneapolis area and had no plans to visit and one who was at sea with the Navy. The interviewers were blind to participants' infant attachment classifications.

Before scoring, each interview was typed, compared with the audiotape, and if necessary corrected. Two of the authors who had completed AAI training seminars conducted by Dr. Mary Main served as coders. Inter-rater agreement was assessed by using 25 of 50 transcripts. Agreement for this sample on the three major attachment classifications was 84%, $\kappa = .72$, $p < .001$. The distribution of AAI classifications was 25 (50%) secure, 16 (32%) insecure dismissing, and 9 (18%) insecure preoccupied. One participant in each group was classified unresolved.

Negative life events. One of the cornerstones of Bowlby's theory is that attachment-related expectations and working models remain open to revision in light of changes in the availability and responsiveness of secure base figures. That is, attachment theory predicts both stability under ordinary circumstances and change when negative life events alter caregiver behavior. To test the hypothesis that changes in attachment classification would be related to negative life events, we obtained a score on negative life events from each participant's AAI transcript. Negative life events were defined as (1) loss of a parent, (2) parental divorce, (3) life-threatening illness of parent or child (e.g., diabetes, cancer, heart

Table 1 Stability of Attachment Classifications from Infancy to Adulthood

Adult Attachment Classification (AAI)	Infant Attachment Classification (Strange Situation at 12 months)		
	Secure (B)	Avoidant (A)	Resistant (C)
Secure (F)	20	2	3
Dismissing (D)	6	8	2
Preoccupied (E)	3	2	4

Note: S/S = Strange Situation.

Stability:

64% (3 groups each age) $\kappa = .40, p < .005$ 72% (secure versus insecure) $\kappa = .44, p < .001$

τ (S/S dependent) $= .17, p = .002$
 τ (AAI dependent) $= .17, p = .002$

τ (S/S dependent) $= .20, p = .002$
 τ (AAI dependent) $= .20, p = .002$

and (5) physical or sexual abuse by a family member. The coders who counted negative life events did so without knowledge of the participants' Strange Situation or AAI classification and without training in the AAI scoring system. To allow time for the impact of such events to be reflected in the AAI, we limited the counts to events that had occurred before age 18. To determine whether results were specific to this method of ascertaining stressful life events, we examined events reported by checklist 1 year later. Forty-seven completed a checklist of life events that included all of the events identified in the AAIs. This method depends less on free-recall, the manner in which interview questions are posed, the participant's state of mind, and the amount of material produced in the AAI. These data are relevant to the present study and to the accompanying studies that obtained life events from the AAI. Participants were divided into those reporting none and those reporting one or more of the target experiences. The one or greater criterion was set a priori on the basis that all of the target experiences would be considered major life events in current research on stress and coping; each has the potential, on its own, to change expectations about caregiver availability and responsiveness.

Agreement on life events classification (none versus one or more) by AAI and checklist was 78.7%, $\kappa = .57, p < .002$. Twenty-two participants were classified "none" and 15 were classified "one or more" by both methods. Eight were classified "one or more" by the checklist but "none" by the AAI. Two were classified

RESULTS

As hypothesized, early attachment security with mother was significantly related to AAI attachment security 20 years later (see Table 1). Using three clas-

were assigned to corresponding classifications in infancy and early adulthood, $\kappa = .40, p < .005$; $\tau = .17, p = .002$ (AAI dependent).¹ Thirty-six out of 50 participants (72%) received the same classification using the secure-insecure dichotomy, $\kappa = .44, p < .001$; $\tau = .20, p = .002$.

Thirty-six percent of the participants changed classification from infancy to early adulthood. Reliability and validity problems with the attachment measures certainly account for some portion of the observed change. Nonetheless, the results also suggest that experiences beyond infancy also play a role in adult security. We examined this by counting the number of attachment-relevant negative life events mentioned in each participant's AAI transcript and relating this to whether the participant retained or changed attachment classification across age. These results are presented in Table 2. When mothers had reported no stressful life events, attachment stability (three groups each age) was 72%, $\kappa = .465, p < .009$; τ (AAI dependent) $= .23, p = .006$. For the secure versus insecure dichotomy, stability was 78%, $\kappa = .525, p < .009$; τ (AAI dependent) $= .28, p = .003$.

¹ Cohen's κ is computed from (1) the maximum level of agreement possible (100%), (2) the proportion of concordant cases (in the diagonal cells) expected by chance (from cross-multiplying marginals), and (3) the observed proportion of agreements. κ is equal to the proportion of possible agreement over and above chance that is actually obtained. In addition to the significance test associated with κ , the statistic itself can be construed as an indication of effect size. To determine whether any of the present results are specific to the statistic used, we also report, where appropriate, an alternative concordance index (Goodman & Kruskal's τ , by means of SPSS) based on a different model of chance agreement levels. When computed with AAI dependent, τ reflects the proportional reduction in error when the Strange Situation classification is used to predict AAI classification. Complete data from which other indices can be

Table 2 Relations of Stressful Life Events to Change in Attachment Classifications

Number of Stressful Life Events Reported	Stability and Change from 12 Months to 21 Years	
	Retained Security Classification on AAI	Changed Security Classification on AAI
None		
Total S/S sample (n = 32)	25 (78%)	7 (22%)
Secure in S/S (n = 20)	17 (85%)	3 (15%)
Insecure in S/S (n = 12)	8 (75%)	4 (25%)
One or more		
Total S/S sample (n = 18)	10 (61%)	8 (39%)
Secure in S/S (n = 9)	3 (33%)	6 (66%)
Insecure in S/S (n = 9)	7 (89%)	2 (11%)

Note: S/S = Strange Situation.

Hierarchical multiple regression analyses were used to determine whether (1) secure and insecure infants were equally likely to change attachment classification, (2) mothers of secure and insecure infants were equally likely to report stressful life events, (3) infants whose mothers reported experiencing stressful life events were more likely to change attachment classification from the initial to the follow-up assessment, and (4) secure versus insecure infants whose mothers report stressful life events were equally likely to change classification. The analyses used stressful life events (presence versus absence), infant attachment classification (secure versus insecure), and their interaction to predict whether infants' attachment classifications (secure versus insecure) changed or remained the same over the course of the study.²

After first entering stressful life events, R^2 change for infant classification = .01, $F(2, 47) = .50$, $p < .49$. Thus, there was no difference in the likelihood that secure infants (31%, 9 of 29) and insecure infants (28.6%, 6 of 21) would change classification from infancy to early adulthood. After first entering infant attachment classification, R^2 change for presence or absence of stressful life events = .09, $F(2, 47) = 4.64$, $p < .037$. Thus, infants whose mothers reported one or more stressful life events were more likely to change attachment classification (44.4%, 8 of 18) than infants whose mothers reported none (21.9%, 7 of 32). Finally, after both attachment classification and stressful life events were included in the analysis, the interaction

² The results in Table 2 also suggest hypotheses about changes from insecure to secure attachment in the absence of stressful life events. These deserve to be pursued with appropriate statistical power in a larger sample or meta-analysis of data from several studies. Independent assessment of stressful life events and caregiver-child interaction at several points between the initial and follow-up attachment assessments would also be useful.

term in the analysis was also significant, R^2 change = .14, $F(3, 46) = 8.48$, $p < .006$. Stressful life events were significantly related to the likelihood of a secure infant becoming insecure in early adulthood (66.6% if mother reported one or more events versus 15% if she reported none, $p < .01$) in secure infants. Stressful life events were not significantly related to classification changes in insecure infants. Among insecure infants whose mothers reported one or more such events, 22% became secure as young adults versus 33.3% if mother reported none ($p < .59$).

Although attachment-related stressful life events were most often associated with changes from secure to insecure attachment, this was not always the case. One participant, whose parents responded with consistent sensitive care to the childhood onset of a lifelong illness, changed from insecure to secure. The relationship between life events and attachment patterns across time was not perfect. Eight participants reported significant attachment-related stressful life events and yet retained their infant attachment status in early adulthood. Similarly, nine participants reported no such events and yet changed attachment classification.

DISCUSSION

The present data provide strong evidence for the value of the secure base concept as a conceptualization of attachment relationships in infancy and adulthood. They also support Bowlby's expectation that individual differences can be stable across significant portions of the life span. Finally, they confirm the notion that, throughout childhood, attachment representations remain open to revision in light of real experience.

The success of the secure base concept as a conceptual foundation for both the Strange Situation and the AAI is important support for the notion that early and late relationships have something in common.

Moreover, the present stability data support the notion that these relationships are not merely similar in kind but somehow developmentally related. Processes that may be contributing to stability include (1) consistency in caregiver behavior across time, (2) a tendency toward persistence in early cognitive structures, (3) the relatively moderate intensity and low frequency of attachment-related stressful events in this middle-class sample, (4) the effects of individuals on their environment, and (5) stabilizing effects of personality trait variables (Waters, Kondo-Ikemura, Posada, & Richters, 1991). This study was designed to stimulate interest and help in the design of research into the roles that such mechanisms play in the consistency of attachment stability over time.

A portion of the change noted in this study is attributable to measurement error. Imperfect scoring agreement introduces approximately 10% error at each age. In addition, a similar amount of error is attributable to the fact that neither the Strange Situation nor the AAI is perfectly reliable; behavior observed in a given assessment may not be entirely representative of the person's typical behavior (see Ainsworth et al., 1978, and Crowell & Treboux, 1995, for test-retest data). Correctly estimating these psychometric factors in change is important to understanding our results. Accurately assessing both stability and change is important; minimizing either would be a mistake. As Vaughn, Egeland, Sroufe, and Waters (1979) emphasized, Bowlby's attachment theory predicts both stability and change.

The portion of change in attachment classifications that proved correlated with attachment-related stressful life events provides important support for Bowlby's ideas about (1) the openness to change of attachment representations, and (2) the importance of real-world experiences in such change. Research on the mechanisms through which experience leads to change in attachment representations deserves high priority in current attachment research. An important conclusion from this study is that the AAI is sensitive enough to experience to serve usefully in such work. The types of events associated with change in attachment security and the underlying mechanisms of change deserve careful analysis in shorter-term longitudinal designs.

Middle-class samples offer both advantages and disadvantages. They represent a large segment of the population and are ordinarily accessible, cooperative, and interested in research. This was evident in the fact that each of the participants we recontacted agreed to participate in the AAI. The educational level of middleclass participants is also an asset because the AAI makes heavy demands on a wide range of conceptual and verbal abilities. At the same time,

the inherent stability of attachment security. Both a relatively low rate of negative attachment-relevant experiences and social support structures that buffer secure base expectations against such experiences may also contribute to the stability of secure attachment in middle-class samples, just as consistent high levels of stressful events contributes to the stability of insecure attachment in disadvantaged samples.

Strong social support structures might reduce the number or impact of negative experiences and thus increase stability; they could also attenuate links between negative experiences that occurred and attachment stability. The best way to address these concerns is to examine both the stability of attachment in other populations and the mechanisms of change in close detail to understand why any participant would stay the same or change. The accompanying studies provide important information about stability and change in populations with very different patterns of caregiving and life events.

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The Stability of Attachment Security from Infancy to Adolescence and Early Adulthood: General Discussion

Everett Waters, Nancy S. Weinfield, and Claire E. Hamilton

For over three decades, critics of the developmental and psychometric paradigms have argued that individual differences are neither stable coherent, nor clinically significant. The present studies extend a long line of research demonstrating the coherence of individual development in attachment security. They make it clear that attachment security can be stable from infancy through early adulthood and that change in attachment security is meaningfully related to changes in the family environment. The task now is to better understand the roles of cross-age consistency in caregiver behavior and the structure of mental representations of early experience in stability and change.

INTRODUCTION

According to Bowlby (1973, 1980), experience with primary caregivers leads to expectations and beliefs ("working models") about the self, the world, and relationships. He described these representations as persistent and yet open to revision in light of experience. Persistent attachment representations allow positive secure base experiences to guide behavior when someone "stronger and wiser" is not at hand. They also afford a degree of buffering against future unsupportive and disappointing relationship experiences. An unfortunate corollary is that unsupportive care also results in expectations and beliefs that guide (mis)behavior and complicate relationships (Bowlby, 1985).

Flexibility in working models is also important. Openness to experience is a hallmark of Bowlby's (1969) control systems motivation model, his view of attachment development, and his desire for attachment theory to have a significant impact on clinical practice (Bowlby 1973, 1988). Bowlby's emphasis on the importance of real (as opposed to intrapsychic) events in personality development and psychopathology was a major departure from classic psychoanalytic theory. Although Bowlby (1969) implied that the onset and consolidation of attachment patterns was accomplished in early childhood, much of his theory and

clinical work envisioned working models evolving and responding to experience through adolescence (Waters & Cummings, 2000).

The results of the three studies presented here show a mix of continuity and discontinuity in attachment from infancy to adolescence and early adulthood.¹ Two of the studies (Hamilton, 2000; Waters, Merrick, Treboux, Crowell, & Albersheim, 2000) found significant continuity over time, and one study (Weinfield, Sroufe, & Egeland, 2000) found no significant continuity over time. At first glance, the findings across these studies might be considered inconsistent. Closer examination, however, reveals that a commonality ties these studies together into a coherent picture: Across the three studies there is consistency in the role of attachment-related life experiences in marking continuity and change.

These studies make clear that attachment security can be stable from infancy through early adulthood and that change in attachment security is related to meaningful changes in the family environment. Both Waters et al. (2000) and Hamilton (2000) found that the majority of their participants maintained the same attachment status over time. Waters et al., studying a middle-class sample, found that changes in attachment classification were associated with the occurrence of negative life events. Hamilton, studying an alternative lifestyle sample, also found that these neg-

Summary discussion of Waters, Hamilton, & Weinfield, "The Stability of Attachment Security from Infancy to Adolescence and Early Adulthood: General Introduction"; Waters, Merrick, Treboux, Crowell, & Albersheim, "Attachment Security in Infancy and Early Adulthood: A Twenty-year Longitudinal Study"; Hamilton, "Continuity and Discontinuity of Attachment from Infancy"; and Weinfield, Sroufe, & Egeland, "Attachment from Infancy to Early Adulthood in a High-Risk Sample: Continuity, Discontinuity, and Their Correlates."

¹Although these studies are the only such studies currently completed in the United States, two other studies of continuity of attachment from infancy to age 16 have been completed in Germany. For further information, see Becker-Stoll (1997) and Zimmermann (1994).

ative life events operated primarily by maintenance of already established patterns of insecurity or by movement from secure to insecure patterns. Overall, however, there was a moderate rate of attachment-related negative life events in both of these samples.

Weinfield et al. (2000) investigated these same issues in a highly stressed sample, in which attachment-related negative life events were far more frequent and more severe than in the Waters et al. (2000) and Hamilton (2000) samples. The participants in this study did not maintain the same attachment classifications. These were not, however, random changes; change was associated with specific factors, such as maternal depression, that have every likelihood of negatively affecting caregiver availability and responsiveness.

Rather than being inconsistent, the findings of these three studies present a coherent picture of attachment as a dynamic process over the course of development. Vaughn, Egeland, Sroufe, and Waters (1979) have emphasized that attachment theory requires both stability and change. The theory requires significant stability-but not when existing beliefs about significant others and relationships are under assault. It also requires change-but primarily where life experiences challenge existing beliefs and expectations. Ainsworth (1995) suggested that research showing a combination of stability and change requires careful examination of the rules and processes that govern both pathways; both stability and change are findings that merit further

MODELS AND MECHANISMS OF STABILITY AND CHANGE

As Waters et al. (2000) indicate, stable individual differences do not explain behavior; stability is a discovery that requires an explanation. The present studies do not implicate any particular models or mechanisms of stability. A variety of mechanisms might be in play. Two important candidates are early experience and consistency in caregiver behavior. Rutter (1979) has argued persuasively that, although Bowlby overestimated the risks inherent in separation per se, gross failures of early care may have long-term effects on social development. This is especially likely if family and environmental influences act continuously to maintain early difficulties (Sameroff & Chandler, 1975; Waters, Kondo-Ikemura, Posada, & Richters, 1991).

A number of other processes may also be relevant. For example, Epstein (1973, 1991) suggests that conceptualizations of self and social relationships formed early in life are more general and less open to

ment constructs may also play a role in attachment stability and change, not as an alternative interpretation of attachment measures but rather as moderators of infants' and children's responsiveness to negative life events and insensitive or changing patterns of care. The role of temperament in the development of adult attachment representations has yet to be explored. In addition, developmental theorists have emphasized that individuals have a significant impact on their environments (e.g., Plomin, 1989; Scarr & McCartney, 1983). The effects of early experience and also heritable personality and behavioral traits can exert a continuing bias on parent-child interaction. The result can be a stabilizing effect on both the environment and the child's individual characteristics. Such processes are important to understand because they have important implications for research design and interpretation and also for prevention and intervention.

Change in attachment classification also requires explanation, and although these studies demonstrate that attachment-related life events are associated with change, no specific process or model is implicated. The effects of negative life events on attachment security deserve to be examined in their own right. Negative events could affect attachment security through a number of routes. From the point of view of attachment theory, working models are most likely to change in response to actual changes in caregiver availability and responsiveness. For example, marital problems could produce mood effects or cognitive demands that interfere with the caregiver's availability and responsiveness. Over time attachment representations might change in response to changes in caregiver behavior. Of course, negative events do not have to act directly on the caregiver. They might instead have a direct impact on another family member and then spread throughout the family system, thereby interfering secondarily with caregiving.

Negative events might, also change a child's expectations of a caregiver's availability and responsiveness directly. This might happen, for example, if a caregiver becomes chronically ill and the child infers that he or she is now less available. Attachment representations might then change before (or without) actual caregiving failures. Marital discord could have a similar effect (Cummings & Davies,

THE ROLE OF DEVELOPMENT IN CHANGE

All three studies presented here involve participants who are in late adolescence or early adulthood. Therefore, taking developmental issues into account when considering possible influences on stability and change is useful, particularly with respect to the issue of

tonomy from one's family of origin. Specifically, if one has experienced attachment-related negative life events, the presence of developmentally salient autonomy issues might make change from infant security to adult insecurity more likely.

If it can be inferred from the answers to the Adult Attachment Interview questions that an individual had strong negative experiences or few loving experiences with caregivers during childhood, a secure classification can be achieved only by the individual acknowledging that the experiences were negative and that they affected adult personality. Strong denial that negative experiences were actually negative, or denial that those experiences could have had any effect on the individual's development, will lead to a dismissing classification. A secure classification in the face of negative experiences requires some rethinking and analysis of childhood experience. Young adults who have not gained autonomy from their families of origin may find it too difficult emotionally and cognitively to acknowledge and explore poor treatment by a parent on whom they still depend. It seems plausible, then, that some shifting may occur later, as autonomy is achieved and there is more opportunity for psychological exploration of the impact of childhood experiences.

CONCLUSIONS

The present studies provide descriptive information about the stability and change of attachment organization from infancy to late adolescence /early adulthood in a variety of developmental contexts. They also provide information about the relation between negative life events and changes in attachment classifications. This information is a necessary first step toward process-level research on attachment stability and change.

Any of the processes suggested here are consistent with Bowlby's view that attachment representations arise primarily from real experiences rather than intrapsychic events. Early empirical research on attachment stability (e.g., Waters, 1978) was undertaken in response to a situationist critique that claimed individual differences in attachment were neither stable, coherent, nor of any practical importance (Masters & Wellman, 1974; Mischel, 1968). Two decades of research have demonstrated that, as applied to attachment security, the situationist critique is incorrect. This has not come about because situations and environments proved unimportant. The critique failed primarily because both stability and change have proven more complicated and more interesting than the situationists imagined (Waters et al., 1991).

These studies suggest many possibilities for future avenues of research. First, there is no longitudinal data on continuity of AAI classifications from adolescence to adulthood. Research on AAI stability over this period of time would lend insight into whether late adolescent and adult representations are equivalent, or whether, particularly in cases where there have been negative attachment-related experiences, there is sometimes a period of transition for attachment representations. Second, re-interviewing some of the participants from the studies presented here as they complete the transition to adulthood and more of them become parents would also be informative. This would allow us to explore whether the rates of stability remain the same through adulthood. It would also allow for a prospective examination of intergenerational patterns of attachment.

Rather than simply resolving questions about continuity of attachment, the present studies should be taken as starting points for stimulating more research. These studies demonstrate that attachment security can be stable over very long periods of time. They also demonstrate that high intensity, attachment-related negative events are associated with changes in attachment security over such intervals. The task now is to explain the underlying processes.

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