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Attachment Status and Its Impact on Concurrent and Subsequent Psychological Functioning: A Meta-Analysis of Published Studies

by

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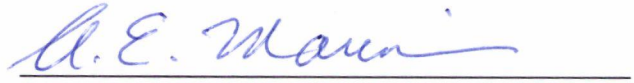
The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies for acceptance, a thesis entitled "Attachment Status and Its Impact on Both Concurrent and Subsequent Functioning: A Meta-Analysis of Published Studies" submitted by Raechelle Dashevsky Paperny in partial fulfillment of the requirements for the degree of Master of Science.



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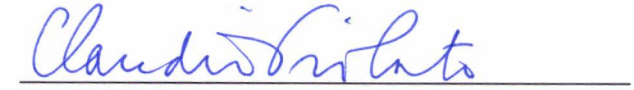

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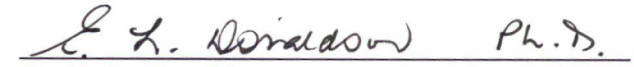

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Abstract

A meta-analysis of published research in the English language was conducted in order to evaluate the effects of security of attachment status at all stages of development on concurrent and subsequent psychological functioning in the cognitive, behavioral, and socio-emotional domains. The stability of attachment status across development and generations was also investigated. Ninety-two studies published between 1977 and 1995 and involving 10, 269 subjects met the inclusion criteria. Results indicated that the relationship between security of attachment status and quality of psychological functioning is significant in all three domains. Attachment status significantly predicted the quality of both current and subsequent functioning. Furthermore, stability of attachment status throughout development was strongly supported by the evidence from short-term longitudinal, retrospective, and intergenerational transmission studies. While the quality of attachment is a lasting issue for personality, evidence of discontinuities emerged. Attachment status did not consistently predict quality of functioning in the three psychological domains. The strength, and even the existence of the relationship varied across gender, samples, and methodologies. The theoretical, research, and social implications of these findings are discussed.

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CHAPTER 1

Introduction

Attachment is a dynamic and developmental process. It has been claimed that secure attachment is a protective factor that encourages adaptive development. In contrast, insecure* attachment is assumed to make a child more vulnerable to environmental stressors and potentially results in pathology. This claim of "pathology" can express itself in a variety of forms, from being physiological in nature-i.e., asthma, to behavioral-i.e.-antisocial personality disorder, to cognitive-i.e., reasoning ability, to socio-emotional-i.e., depression. The relationship between attachment status and quality of functioning is a predictive one, with attachment status predicting the quality of both concurrent and subsequent psychological functioning, thus the notion of developmental continuity is implied. Attachment formation was considered by some to be a critical developmental period beginning at six months and by the age of two or three formed a "prototype" for all future relationships (Bowlby, 1951; Birtchnell, 1993) . Following this reasoning, if an infant has formed an insecure attachment to the primary caregiver, then one would expect that he/she would be insecurely attached to any significant others in all subsequent relations. Hence, stability and irreversibility of early attachment status is assumed.

Attachment theory's strong claims of continuity and stability, have attracted the attention of clinicians, teachers, and developmental researchers because of what they assert about the impact of early experience on later development. Research which has

*Ainsworth initially used the term "insecure attachment", but Bowlby, trying to keep attachment theory consonant with analytic concepts, preferred "anxious attachment". The two terms are now used interchangeably. For the sake of consistency this thesis will use the term "insecure attachment" throughout.

investigated these claims however demonstrates both conflicts and inconsistencies in its findings. While some studies support the stability of attachment status across development, other stability studies and findings from resiliency research suggests that attachment patterns continue to develop and change throughout the course of a lifetime. This ability to change, particularly in the direction from insecure to secure, provides hope and an explanation for some individuals' apparent resiliency. Further, the continuity studies investigating the predictive relationship of attachment status and quality of functioning have often resulted in inconsistent findings. Some studies clearly identify the attachment/functioning relationship, some identify the relationship for only one gender or aspect of functioning, and others are unable to identify the relationship at all. Clearly, a theory with claims as developmentally potent and far reaching as attachment stability and continuity should be explored further in order to attain a better understanding of its role in development and its apparent inconsistencies.

The purpose of this study is to perform a meta-analysis, a statistical summary, of the literature on attachment status at all stages of development and its impact on concurrent and/or subsequent development in the socio-emotional, behavioral, and cognitive domains (continuity). This will perhaps provide some clarity with respect to the nature of the support for continuity, in addition to providing some insight into the potential influences of the apparent inconsistency or discontinuity. The validity of the concept of a critical period for attachment formation and the strength of its stability across development will also be investigated.

Chapter 2, a "Review of the Literature", includes (a) attachment framework, (b) attachment theory, (c) Ainsworth and the Strange Situation, (d) attachment research, (e) Mary Main and the Berkeley studies, (f) evidence for discontinuity, (g) stability and resiliency literature, (h) statement of problem, and (i) summary and purpose. Chapter 3, "Methodology", provides an explanation of meta-analysis, defines the terms, describes the

literature search and the criteria for inclusion of studies, and provides a breakdown of the analysis. In Chapter 4, "Results" are presented under four main headings: (a) descriptive statistics for study characteristics, (b) effect size analysis, (c) study characteristics and effect size, and (d) interpretation of effect size. Chapter 5, the "Discussion" section, is comprised of four parts: (a) implications of findings in context of current research, (b) implications of present findings, (c) strengths and limitations, and (d) summary and conclusions.

CHAPTER 2

Review of the Literature

Attachment Framework

During the past 50 years of psychological research, findings have resulted in revisions and reformations of theories of human development. The nature versus nurture debate is no longer as heated or polarized as it once was. Developmental theorists have now come to recognize the complexity of the interactional and transactional relationship of nature and nurture. One developmental concept however which has been resistant to change is the emphasis on the impact and irreversibility of early experience on later development. Perhaps the popularity of this concept can be attributed to Freud although history suggests it was introduced well before his time. The early parent-child relationship and its importance in the the context of future development can be found in the writings and ideas of Plato, Locke, and Mill (Clarke & Clarke, 1976). But it was Freud who brought this concept to the forefront as the focus of his psychological theory. Few social scientists, Jerome Kagan being one, have attempted to challenge its importance.

Freud's view has been applied to the understanding of the development of social relationships. Currently, there are two models of social development: Freud's view, known as the epigenetic model; and the social network model, assumed by the likes of Kagan and Michael Lewis. The more predominant model in developmental psychology is the epigenetic one which has as its main thesis the notion that there exists a direct relationship from one set of social experiences to the next. It assumes that the infant first adapts to one relationship (usually with the mother) and from this primary relationship future ones follow (Lewis, 1980). In contrast, the social network model as argued by Lewis (1980) does not see one set of social experiences as having direct sequential effects on subsequent social development,

rather "social objects occupy simultaneous importance because they satisfy multiple and differential social needs." Put another way, the social network model proposes that an infant has multiple needs, and depending on the culture, a certain social network is formed to meet those needs. Thus the emphasis is taken off of the ethologically based hierarchy that places all of the developmental importance on the mother-infant relationship and instead suggests the infant can have multiple important relationships, as determined by the culture. A sibling, father, peer, or grandparent could all be meeting the infant's differing needs, and while one relationship will affect another, the development of social relationships in this case is not necessarily linear. For Kagan, who avoids ideological labels, experience at any developmental stage "was like material on a tape; if it could be recorded, it could be erased" (Kagan, 1980, as cited in Sroufe, Egeland, & Kreutzer, 1990). According to him, the most enduring characteristics of a child are the ones he brought with him from birth. In other words, heredity persists.

John Bowlby's attachment theory which is the focus of this study, is very influenced by Freudian psychology and ethology. It also has this epigenetic model as one of its central themes. More specifically, Bowlby's theory focuses on the quality of maternal care that a child receives during his/her early "critical" years which is believed to impact subsequent development of character and mental health (Bowlby, 1951). Unlike Kagan Bowlby believed that present adaptation is always a weave of the current environmental experience and developmental history, especially early childhood history. At the 50th Maudsley Lecture to the Royal College of Psychiatrists, Bowlby (1977) stated:

> The key point of my thesis is that there is a strong causal relationship between an individual's experiences with his parents and his later capacity to make affectional bonds and that certain common variations in that capacity, manifesting themselves in marital problems and trouble with children as well as in neurotic symptoms and personality disorders, can be attributed to certain common variations in the ways that parents perform their roles. (Birtchnell, 1993, p. 335).

From this statement one can quite safely assume that Bowlby's theory was based on the assumption that early inadequate care always causes irreverible damage. Interestingly enough however when Bowlby's theory was later criticized for exaggerating the deterministic nature of the relationship, many attachment researchers came to his defense and said that at no time did Bowlby ever say that the relationship between early attachment status and quality of functioning was a causal one, but merely a predictive one. In reviewing the literature on attachment theory from beginning to present, one is left with the impression that originally Bowlby, highly influenced by the notion of "critical period" from animal research, insisted that what was missed early on (secure attachment) could never be fully replaced. Later, research that demonstrated discontinuities in development forced Bowlby to moderate his claim of irreversibility and acknowledge that early experience could only predict, not determine future adaptation. While there are numerous studies which support the association between early attachment quality and later psychological functioning (Matas, Arend, & Sroufe, 1978; Waters, Wippman, & Sroufe, 1979; Sroufe, Fox, & Pancake, 1983; Erickson, Sroufe, & Egeland, 1985; LaFreniere & Sroufe, 1985; Main, Kaplan, & Cassidy, 1985; Troy & Sroufe, 1987; Cassidy, 1988; Renken, Egeland, Marvinney, Mangelsdorf, & Sroufe, 1989; Kestenbaum, Farber, & Sroufe, 1989; Urban, Carlson, Egeland, & Sroufe, 1991; Suess, Grossman, & Sroufe, 1992; Birtchnell, 1993; Lyons-Ruth, Alpern, & Repacholi, 1993; Sroufe, Bennnett, Englund, Urban, & Shulman,1993; McCormick & Kennedy, 1994; Wartner, Grossmann, Fremmer-Bombick, & Suess, 1994) results from resiliency research and other studies have found little support for the association, and where it has been found it has been ambiguous and/or inconsistent across gender (Lewis, Feiring, McFuffog, & Jaskir, 1984; Bates, Maslin, & Frankel, 1985; Oppenheim, Sagi, & Lamb, 1988; Cohn, 1990; Fagot & Kavanagh, 1990; Goldberg, Corter, Lojkasek, & Minde, 1990; Howes, Matheson, & Hamilton, 1994). It is interesting to note that the majority of the studies which provide support for the attachment-functioning

relationship involve the same group of researchers (namely Sroufe and associates) working with the same data base.

Attachment Theory

The attachment construct was developed and first recognized around 1951, the same time that John Bowlby's monograph on maternal deprivation was published by the World Health Organization. Influenced by Harry Harlow's research with rhesus monkeys and by the maternal deprivation literature, Bowlby concluded that human infants have an innate need for close physical contact with an adult. Further, perhaps because of its survival value and the result of selection pressures, human infants have developed a repetoire of developmental behaviors that are useful in attaining proximity to supportive adults (Lamb, 1987). These are known as attachment behaviors and include such signals as smiling and crying.

Attachment theory developed as a synthesis of psychoanalytic theory, cognitive psychology, and ethology. It refers to a developmental process by which infant-caregiver interactions involving these attachment behaviors, take on a particular style and result in a relationship. The style is determined by the appropriateness and promptness of the adult's response to the infant's attachment behaviors. It is important to note that the style or quality refers to the child's side of a particular dyadic relationship with a caregiver (Rutter & Rutter 1992). Ideally this first relationship provides the infant with a balance between a secure base from which to explore his/her environment and the security that he/she can go back to the secure base (caregiver) anytime he/she feels threatened or anxious. Bowlby (1984) stated it is through the attachment process that a child develops an "internal working model" of "self" and "other". These working models provide the child with their role and expectations in social interactions, as well as the role and expectations of the other person. Attachment theory claims that it is from this first relationship with the primary caregiver (usually the mother) along with the developed internal working model, that the basis of all future relationships in the infant's life is determined. It appears that, somehow, what originates as a

dyadic feature becomes a characteristic of the individual which later predicts to subsequent relationships (Rutter & Rutter, 1992). Hence, the concept of continuity or stability is assumed. The notion of critical period is implied by Bowlby because the security of an attachment relationship and its underlying internal working model is considered to be determined by the end of infancy and is thought to be resistant to change. Thus if a child shows a secure or an insecure attachment by the end of the infancy period, then it will be his/her interactional pattern in future relationships.

The assumption of attachment continuity is critical because according to Bowlby, secure attachment formation is a requirement for future adaptive development. Secure early attachment is assumed to be a "buffer" against any negative environmental stressors, making the securely attached child less vulnerable to maladjustment in the face of adversity. It also follows that if a child has formed the maladaptive insecure attachment pattern, it will increase the child's vulnerability for psychopathology or socioemotional problems later in life.

Insecure attachments can result from poor infant-caregiver relationships characterized by abuse, neglect, inconsistent caregiving, or lack of "goodness of fit". Goodness of fit is a term coined by Chess and Thomas (1982) and refers to a mismatch of infant's temperament and its associated needs, and the caregiver's expectations, needs, and abilities to provide the infant in the relationship. In addition to the above, breaks in attachment (loss and/or separation) or the inability to form attachments (deprivation) also result in, and are characterized as, "insecure attachment". This loss/separation/deprivation could be the result of the experience of trauma, war, hospitalization, adoption, being in foster care or orphanages, or the death of a parent.

Ainsworth and the Strange Situation

Much of the research which has taken place in the area of attachment theory has focused on assessing individual differences in patterns of attachment security and in the

working models which underly them. This research has been possible because of a procedure entitled the Strange Situation (Ainsworth & Wittig, 1969). It developed as part of Mary Ainsworth's grant to perform a pilot study for her next investigation, a longitudinal observation of mothers in Baltimore. Over the next five years Ainsworth and her research team went into homes and observed 23 mother-infant dyads and then developed scales to assess patterns of attachment behavior. Out of this work, the Strange Situation was created, a 20 minute laboratory assessment that would come to be more widely used than any other in the history of developmental psychology (Karen, 1994). It involves the creation of a gradually escalating stressful environment for the infant whilst observing and classifying the infant's responses to this stress. Because the main goal of the attachment behavior system is to attain protective proximity to an adult in the threat of danger and to promote exploration in the absence of threat, during the procedure the parent-infant dyad is placed in a "strange" laboratory environment. The infant is given toys to play with and may interact with with the parent. Meanwhile, a "stranger" enters the room, the parent leaves the room, and the child's reaction is observed and coded by a hidden experimenter. The parent returns as the stranger leaves and the child is expected to settle back down to play. Then the parent leaves again for a shorter episode, leaving the infant all alone. This is followed by a final reunion episode when parent returns. Special emphasis is placed on the infant's response to the parent's departure, its reaction to the stranger, and its response upon reunion with the parent. With this method, the infant's response to this stress is classified into one of four attachment patterns- 1) Secure, Type B; 2) Anxious-Avoidant, Type A; 3) Anxious-Resistant/Ambivalent, Type C; 4) Disorganized/Disoriented, Type D. These four patterns were also found to relate to differing types of caretaking experience.

The Type B infants are considered securely attached because their distress upon separation is swiftly alleviated when reunited with their parent. They greet (physically or verbally) the parent upon reunion, "refuel" their security, and then resume their active

exploration of the environment once their secure base is re-established. This pattern is associated with a senstitively attuned caregiver who is reliable and responsive. In the home environment these babies generally cry infrequently, are inclined to seek and enjoy close bodily contact, and endure small separations without great distress.

Types A, C, and D infants are considered insecurely attached because their behavior deviates from the adaptive pattern described by Bowlby and demonstrated by Type B infants. Their behavior also reveals conflicted or disorganized internal working models. Type A, Avoidant infants, do not appear distressed upon separation in the Strange Situation and tend to ignore their parent even upon reunion. They seem to depend less on their mothers as a secure base in the laboratory procedure but at home are far more clingy and demanding than secure children. This pattern is associated with a rejecting and harsh form of caregiving, and so as a defense in moments of stress these children have learned to shut down their attachment behavior in order to avoid further disappointment.

Type C, Ambivalent or Resistant infants tend to be the most anxious pattern and like the Avoidant infants, tend to be clingy and demanding at home. During the laboratory procedure however, this group tends to become very distressed upon separation. When reunited with the parents they eagerly seek contact while unmistakably show signs of anger and resistance (kicking, pulling away, crying, etc.) so that they are unable to be soothed by the contact they may receive. This pattern is associated with a caregiving style which is characterized by inconsistency and chaos.

Type D, Disorganized/Disoriented attachment, is demonstrated by "dazed" behavior upon reunion with parent, stoppage of movement in postures suggestive of depression, confusion, or apprehension, disordering of expected temporal sequences (e.g. strong avoidance following strong proximity seeking), simultaneous display of contradictory behavior patterns (approaching while head averted, gazing away while in contact), incompleted movements, and undirected expressions of affect (Main et al., 1985). The

children who display this pattern have often experienced maltreatement and their caregivers have frequently endured unusual trauma in their own childhood (Main et al., 1985).

The popularity of this procedure rests on the claims concerning its predictive power with respect to patterns of maternal responsiveness and infant's attachment behavior patterns as assessed by the Strange Situation procedure. In addition to these predictive claims, the procedure has received the most attention because it asserts that Strange Situation behavior predicts important aspects of the child's future behavior such as, cognitive performance and socioemotional adjustment (Lamb, 1987).

As popular as it may be, this procedure is not without its share of critics. Firstly, if it is acknowledged by Bowlby and demonstrated in the research findings that attachment status has the ability to change over development, then why make such a big deal of the predictive validity of Strange Situation classification in infancy? Second, Jerome Kagan argues that even if early experience was formative, he does not believe that this procedure measures it. For him it is unreasonable to believe that the interactional history between an infant and its caregiver which has existed for one year in the home, could be revealed in six minutes in an unfamiliar room (Kagan, 1984). Kagan feels that these attachment patterns actually reflect inborn temperament or the internalization of parental or cultural values. In this case he feels the classification system is narrowly defined by American societal values, a concern which was raised by cross-cultural validation studies with northern German infants. In these studies Klaus and Karin Grossmann found two thirds of the sample Avoidant, two and a half times the number of avoidant infants were identified in their northern German sample than in the middle-class American samples. This phenomenon was attributed to the fact that in this part of Germany, dependency was encouraged and highly idealized. However, much to the chagrin of Kagan, although culturally normative, this attachment pattern was adjusted to at a cost. The secure children in this German sample demonstrated numerous psychological advantages over the Avoidant children in the following areas: higher quality of play, better

ability to handle conflicts with peers, keener social perception, and possessed the ability to approach parents when lonely, sad, or distressed (Karen, 1994).

The most global critique of Ainsworth's Baltimore research came from an article by former student, Michael Lamb. Although generally discredited by the attachment community as dismissing Ainsworth's work in a slanderous and insulting tone and full of misstatements of fact, Lamb's critique did raise some legitimate points. In particular, it noted that Ainsworth's study has only received one full replication (the Grossmanns' work). This lack of replication is seen as a problem because most predictive studies start off with assessing attachment in the Strange Situation at 12 or 18 months, next assess some form of functioning years later, and then draw conclusions about the subsequent developmental effect of the attachment style. The dilemma lies in the fact that in most cases the parenting style is never assessed in the same manner as Ainsworth assessed it (72 hours of home observation over the course of a year). The majority of cases perform no assessment of care and only infer it from an infant's Strange Situation classification. Therefore, if Ainsworth's original study was flawed and the correlations are suspect, then the whole attachment framework as developed by Ainsworth could crumble.

Despite these concerns Ainsworth's method has and continues to provide support to Bowlby's ideas, and has played a vital role in introducing attachment theory to developmental psychology.

Attachment Research

Of all of the research studies investigating the predictive validity of infant attachment status on psychological functioning, none have been more affirming of this association than those conducted by Alan Sroufe and his colleagues in the Minnesota Studies. Building upon a short term longitudinal study by colleague Everett Waters (which provided support for the stability of dyadic attachment status between 12 and 18 months), Sroufe set out to show stability in the general quality of the child's adaptation. To do so, he gathered 48 two-year-

olds whose attachment status had been assessed by Waters six months previous. Sroufe assumed that the prominent indicators of well-being at one age would be expressed by different behaviors later but that a underlying connecting pattern would persist. The underlying pattern which he chose to look for was behavioral, a demonstration of greater autonomy, flexibility, resoucefulness, and the ability to use the assistance of their mothers without being dependent on it (Karen, 1994). The activity and behaviors which would allow the two-year-olds to express this pattern was a play task and clean-up session involving mothers and toddlers. In almost every respect, the securely attached children performed these tasks better than the insecurely attached children. They engaged in more symbolic play, demonstrated more flexibility in managing their emotions and desires, and showed greater enthusiasm, more persistence, more responsiveness, and less frustration (Matas et al., 1978). The correlations found in this study convinced Sroufe to pursue this longitudinal research and eventually proceed to assess children at age three and a half. Similarly, the results identified a secure group at three and a half that was substantially more advanced in relationships, more sympathetic to peers' distress, and more desirable to their peers (Waters, 1979).

In 1974 Sroufe and his colleague Byron Egeland recruited a new sample for longitudinal investigation: two hundred and sixty expectant mothers all young (mean age about 20), mostly single with few social supports, and for the first time, all low income. These mothers and their children became the subjects in numerous studies over the next two decades. Their development was closely followed in a specially created nursery school on the Minnesota campus and at a summer day camp watched by the Minnesota team. This sample provided findings which supported the stability of attachment status from infancy to adolescence. The support came in the form of evidence confirming Sroufe's predictions: demonstrating that at age 4½ to 5 years children with secure attachment histories scored higher in areas of ego resiliency, self-esteem, independence, peer social competence, positive

feelings, and popularity. Equally as important, the findings demonstrated that preschoolers with insecure attachment histories displayed overdependency, increased peer conflict, higher incidence of peer rejection, victimization (avoidant attachment), bullying (avoidant attachment) and behavior problems (Erickson et al., 1985; LaFreniere & Sroufe, 1985; Sroufe et al., 1983; Troy & Sroufe, 1987).

As they followed this sample through early and middle childhood, and into adolescence, observing play and peer interaction and obtaining teacher ratings and assessments of functioning in numerous areas, significant differences were found among children with differing attachment histories on measures of social competence, ego resiliency, dependency, and interactional patterns. Specifically, the secure group was considered to be more ego resilient, popular, and display greater social competence; whereas those with insecure attachment histories were rated higher on dependency; were more frequently involved in interactions with adults than their secure counterparts; and showed a higher incidence of gender boundary violation, aggression, (avoidant attachment), and passive withdrawal (resistant attachment) (Renken et al., 1989; Sroufe et al., 1993; Urban et al., 1991).

In summary, the association between early attachment quality and subsequent level of adaptive functioning was found to persist through to age fifteen (Sroufe et al., 1993). It is important to note that the nature of these observed relationships was predictive, not causal, and therefore was not accurate for every individual, but for the group as a whole. Furthermore, it should be reminded that the Minnesota sample contained families from a low socio-economic level with very little outside support. It could be assumed that these children probably experienced more inconsistency, insensitivity, and rejection than Ainsworth's original middle-class sample. Consequently, these circumstances may have produced more drastic consequences (i.e., aggression, social incompetence) of insecure attachment than would have normally been the case.

Nevertheless, the apparent continuity of the effects of early attachment histories found in the Minnesota studies is impressive and raises the question: what underlying mechanism supported this apparent stability? Going back to Bowbly's theory the answer becomes evident- the internal working model, but up to this point the only the differences in attachment between secure and insecure children had been investigated behaviorally. It was not until psychologist Mary Main and her colleagues in the Berkeley studies pointed out that it is not the behavior patterns that are at the center of all this, they are merely manifestations of the child's internal working model; it is the child's attachment mental representations which must be investigated (Karen, 1994).

Mary Main and The Berkeley Studies

Having also launched a longitudinal study which assessed attachment at twelve and eighteen months, Main and colleagues identified and established what is now known as the disorganized/disoriented attachment style-Type D. They also found that not only had many of these Type D infants been abused, but many of their mothers had experienced severe trauma and loss in°early childhood which had never been resolved. It was hypothesized that the mother's anxiety and fears had been unconciously transmitted to the infant. In 1992 when the subjects were six years-old, the Berkeley group developed a project which would not only look at stability and assess functioning, but would capture something about the way Bowlby's internal working model expressed itself in speech. According to Main, a child's early attachment experiences result in a mental model which guides and organizes his/her behavior, emotions, attention, memory, and cogntion in attachment related domains (Main et al., 1985). It was further reasoned that individuals with different attachment histories would not only have different mental models but different "patterns of language and structures of the mind." It was believed that these mental models are stable and continually pervasive, but manifest themselves differently at different stages of development. The procedure which was

to develop out of this research would be known as the Berkeley Situation; sort of a Strange Situation for six-year-olds.

The children in this sample were brought to the laboratory, were separated from their parents who were to experience their own interview, and then shown a series of photographs depicting children who were undergoing separations from their parents (e.g.- a parent saying good night to a child, bringing the child to the first day of school, etc.). The children were asked to explain what each child in the photograph might feel and do in response to the imagined separation. As predicted, consistent patterns emerged in the language style and content which reflected the associated internal working models of the four different types of attachment histories. Those with secure attachment histories often recognized that the separation was sad or fearful but not beyond management and frequently related the depicted experience to their own experience. Avoidant and ambivalent children also recognized the sadness and loneliness associated with the separation but their responses were different.

The avoidant children were generally distressed by the discussion and could not come up with suggested reaction responses. The surface detachment that the avoidant child presented in the Strange Situation at one year did not seem to be as successful a mechanism in a stressful situation at age six, when they appeared flooded with anxiety (Karen, 1994). The responses of the ambivalent children manifested their contradictory impulses of proximity seeking and rage toward their parents. For example, an ambivalent child who was asked for a response to a parent's leaving on vacation for two weeks might answer: "he (the pictured child) would chase after them and then shoot his gun at them." Disorganized children on the other hand did not discuss the sadness or loneliness which may be felt by the portrayed child, but spoke of the fear. Their responses were also often contradictory, repetitive, accompanied with aggression, or in incomprehensible language.

In the next step, the children were presented with Polaroid photographs of themselves with their parents taken when they first arrived at the lab. It was hypothesized and then confirmed that the separation pictures would arouse separation anxiety and that by showing photographs of them with their families (a form of reunion) while their anxiety was still high, their attachment history status would be evident in their response. The children were then physically reunited with their parents while their responses were being observed and recorded. The reunions and responses to the photographs were consistent with predictions, they succeeded in reflecting the childrens' internal representations of their attachment experience with their parents.

This support for Main's belief, that we reveal our inner life in what we say, paved the way to responses to questions which previously could not be answered. Specifically, how does the way an adult speaks of his/her early childhood experiences, reflect how he/she currently approaches intimate relations? Or, how does the way a parent speaks of his/her childhood reflect the quality of his/her attachment to his/her child? These answers started to emerge from the parent interviews that were simultaneously conducted with the six-year-old assessments in the Berkeley Situation, and marked the beginning of a second revolution in attachment studies.

In their project which set out to assess the internal working models of six-year-olds, those of their parents' were also assessed and analyzed using a semi-structured interview which was to be later known as the Berkeley Adult Attachment Interview (George, Kaplan, & Main, 1985). In this one hour structured interview, adults are asked for detailed descriptions of their early family situation, their parents, any experiences of illnesses, separations, loss, or feelings of rejection. The interview does not so much focus on the early childhood attachment experience, but more on what the individual thinks and feels in retrospect. The transcription is then analyzed with the focus not so much on the experience content as on the coherency, quality of memory, and anger issues. It is based on these

features, that adult attachment status is detemined. Research using this method has established support for the intergenerational transmission effect (Cohn, Cowan, Cowan, & Pearson, 1992), demonstrated by high concordance rates between parent attachment status as assessed in the Adult Attachment Interview (AAI) and their infant's (assessed in the Strange Situation). In addition, other studies involving the Adult Attachment Interview have resulted in identified links between adults' working models of childhood attachment relationships and adaptive functioning in intimate adult relationships (Cohn, Silver, Cowan, Cowan, & Pearson, 1992).

At this point in attachment research history, investigators were now coming to realize that they were no longer limited to longitudinal studies which began with assessment of Strange Situation behavior at twelve months and follow for years to come, because not only had support for the continuity hypothesis been provided, but more importantly they now possessed the knowledge and means to assess mental representations of attachment at any stage of development. Out of this realization and new found freedom came studies and measures which investigated retrospective as well as concurrent attachment status in relation to the level of adaptive functioning at various stages of development, and in domains which had not yet been studied.

According to most developmental theories, every stage of development is associated with the mastery of a certain developmental task as a requirement for adaptive functioning at the next level. In infancy this task could be seen as attachment formation; for preschoolers perhaps the development of friendships, and so on. The adolescent period for example, and its associated developmental task of psychological individuation from parents became the focus for many of these researchers. Adolescent attachment status, assessed retrospectively to early attachment to parents, and concurrently, was then used to predict current functioning in specific areas. Concurrent attachment status was found to relate to individual differences in psychological well-being, as well as to a vulnerability to depression

(Armsden & Greenberg, 1987; Armsden, McCauley, Greenberg, Burke, & Mitchell,1990) psychological adjustment to college (Kenny & Donaldson, 1991), and to symptoms of eating disorders (Kenny & Hart, 1992).

Evidence for Discontinuity

In the flurry of this new wave in attachment research, most of it appearing to support Bowlby's theory, some inconsistencies and ambiguities regarding the predictive relationship of attachment status and quality of functioning were identified. First, inconsistencies appeared across gender. In some studies, attachment status' predictive relationship to functioning was only significant for boys (Lewis et al., 1984; Cohn, 1990) while in other studies the association was strictly significant for girls (Fagot & Kavanagh, 1990; Suess et al., 1992). In the 1984 Lewis et al. study, a link between attachment status at 12 months and socio-emotional behavior at age 6 was found to be significant for boys only. However, even among the males who were earlier classified as insecurely attached, only 40% later showed signs of disturbed behavior, and those were likely to have experienced environmental stress. One explanation for these findings is that the results appear to be dependent on the samples' socio-economic status. Studies which investigated the predictive relationship of attachment status on the social competence in high-risk samples have exhibited confirming evidence for both boys and girls (Erickson et al., 1985), whereas those employing a middle class sample such as Cohn (1990) reported associations only for boys. Further, it may be that males and females in coping with their insecure attachments, develop differing behavioral strategies. In Sroufe's poverty sample, insecure avoidant boys were more likely to demonstrate externalizing behavior problems (i.e., aggression, lying, cheating, assertion, disruption of the class, throwing temper tantrums, defiance). Avoidant girls, on the other hand, perhaps because they are biologically less aggressive and/or they are more likely to cope with anxiety in more socially approved ways, were more likely to internalize their feelings. In contrast to

striking out at someone, internalizing is more apt to be expressed by depression or feelings of shame or fear.

One of the few studies of this gender effect, conducted by Turner (1991), supports this hypothesis by demonstrating that the stereotyped qualities that are associated with boys and girls - such as smiling and compliance in girls and angry aggression in boys - represents how insecure attachment functions in each group. In her sample, the insecurely attached boys were far more aggressive than any other group. In fact, secure boys were no more aggressive than the secure girls. Both secure boys and girls showed equal amounts and degrees of positive expression, while the insecure girls, expressed substanially more pleasure and smiled more at their peers than any other group (Karen, 1994). This excessive positive expression displayed by the insecure girls could be deemed as a method for dealing with the anxiety they have over a desire to be loved but the expectation that it will not be provided. The fact that that insecure attachments expressed by males is that much more overt and disruptive, may also explain why Rutter (1982) concluded that boys tend to react to stressful family circumstances with greater emotional and behavioral consequences.

The inconsistencies in the results go beyond gender effects and seem to also depend on who is the reporting agent with respect to the child's functioning. In Fagot and Kavanagh's (1990) study, parents of children classified as secure and insecure reported approximately the same number of problems, whereas the teachers and observers of these same children in the playgroups reported insecure girls as being more difficult to deal with and as having poorer relationships with peers.

This ambiguity is further enhanced by studies that report results which appear to be dependent on the type of attachment relationship that is assessed. In two studies, infant-parent attachment status as assessed at 12 months was not found to predict social competence with peers at 4 years (Howes et al., 1994; Oppenheim et al., 1988). Yet, these

same two studies did support a relationship between infants' attachment status with other figures (teachers, and kibbutz caregivers) and 4 year-old social competence.

Finally, various studies investigating attachment status and quality of functioning within the same domain have found conflicting results. For example, both Bates et al. (1985) and Goldberg et al. (1990), found that infant-mother attachment was not a good predictor of behavior problems at ages 3 and 4 respectively, while Erickson et al. (1985) report that the majority of 4 year-old children in all three of their behavior problem groups had been insecurely attached as infants. Similarly, conflict arises when Howes et al. (1994) reports no relationship between infant-parent attachment and later social competence with peers, Lieberman (1977) reports security of attachment correlated only with non-verbal measures of peer competence, and Waters et al. (1979) reports that infant-mother attachment quality at 15 months was related to preschool peer competence.

Notwithstanding methodological differences among the conflicting studies, one hypothesis which could account for the differences is that the attachment/functioning predictive relationship is strictly valid with respect to specific aspects of functioning within a particular domain and not with general domain functioning. So that if two studies are assessing early attachment status and its association to behavior problems at age four, depending on what type/s of behavior is being assessed (externalizing/internalizing problems, home/school behavior, peer/adult behavior, etc.) this parameter will determine the similarity of the results.

Stability and Resilience Literature

The concept of a "critical period" for attachment formation is challenged by resiliency and stability of attachment classification studies. Support for the stability of attachment status has been provided by findings from short-term stability studies (Waters, 1978; Main & Weston, 1981; Main & Cassidy, 1988; Wartner et al., 1994) and studies which employ the Adult Attachment Interview (AAI) to establish intergenerational

transmission of attachment status (Main, et al.; Benoit & Parker, 1994; Ward & Carlson, 1995). The rate of stability demonstrated in the AAI intergenerational transmission studies ranged from 81% (Benoit & Parker, 1994) to 78% (Ward & Carlson, 1995) correspondence between mothers' and infants' attachment classifications (3 group: A,B,C). In their stability study of 33 families, Main and Cassidy (1988) found that sixth-year attachment classifications to mother were found to be highly predictable from infancy attachment classifications to mother (84%). However, not all of the stability studies found such substantial concordance, some identified only moderate stability of classifictions over a six month period ranging from 12 to 18 months of age with approximately 60% of attachment classifications remaining stable (Egeland & Farber, 1984; Frodi, Grolnick, & Bridges, 1985; Cicchetti & Barnett, 1991). Moreover, stability studies which consisted of high risk or maltreated samples did not demonstrate a higher rate of stability in attachment classifications between 12 and 18 months than would be expected by chance alone, with percentages of stability of approximately 50% (Vaughn, Egeland, Sroufe, & Waters, 1979; Thompson, Lamb, & Estes, 1982; Schneider-Rosen, Braunwald, Carlson, & Cicchetti, 1985). These results seem to suggest that environments characterized by upheaval (i.e., abuse) increase the likelihood of change in classifications over time.

Evidence from the resiliency studies also seems to suggest that individuals' classifications have the potential to change over time, not just during the infancy period or across generations, but beyond childhood. Many clinical case studies are contained in the literature, that reflect children's adaptation to a variety of stressors: poverty, migration, war, the Holocaust, loss and bereavement, divorce, chronic illness, physical handicap, parental psychopathology, natural disasters, to name a few (Garmezy, 1987). These cases offer dramatic evidence of what is referred to as resiliency. Michael Rutter, who pioneered the study of the protective factors of resilient or stress-resistant children, reported at cases of children raised in institutions. Assuming these individuals had had little opportunity to

establish secure primary attachments, he looked at the factors which may have influenced the apparent resiliency in those who, as adults, were well adjusted. He concluded that positive school experiences, dispostional attributes (i.e., easy temperament), gender, intellectual ability, internal locus of control, and the opportunity to form secure attachments with those other than parents (i.e., spouses, peers, teachers, relatives) are all factors which potentially function as protective mechanisms (Rutter, 1987). Even in attachment research, indications of change or "resiliency" appear from those who, despite insecure attachement histories, later function as adaptively as those who have secure attachment histories.

As previously mentioned, Bowlby, and consequently attachment theory, had been highly influenced by ethology, particularly by Harlow's work with rhesus monkeys. Harlow had demonstrated maternally deprived monkeys exhibited persistent abnormalities into adulthood, particularly in social and sexual behavior. As parents, the monkeys were abusive and often murdered their own young. These findings brought credence to Bowlby's claim that early maternal deprivation results in maladaptive development. However, later studies conducted by Harlow's successor demonstrated that these deprived monkeys could gradually learn social skills and become virtually normal if placed with a group of younger, "therapist" monkeys (Suomi & Harlow, 1972). Furthermore, intervention studies involving insecurely attached human infant-mother dyads, demonstrate that infant-parent psychotherapy can improve quality of attachment and social-emotional functioning beyond the first year (Lieberman, Weston, & Pawl, 1991).

In an attempt to challenge the postition that the effects of early adverse experience could be substantially erased, Sroufe went back to his poverty sample and examined children whose level of functioning had shown extreme declines or improvements. He found that children who had changed from early insecure attachments but were functioning adaptively in later years, were likely to relapse to the functioning which corresponds with their early attachment history in times of stress. Similarly, those who were securely attached as infants

but who by preschool could not be distinguished from those with insecure attachment histories, were more likely to rebound than children who had been originally classified as insecurely attached (Karen, 1994). Furthermore, Sroufe was able to refer to the rhesus monkey findings which indicate that even Suomi's rehabililitated monkeys relapse under some conditions (Sroufe et al., 1990). These findings suggest that something - either an underlying strength or vulnerability- remains from early attachment experience. This view is still a matter of contention, however it is safe to say that certainly evidence exists for both stability and change.

Statement of Problem

Bowlby and Ainsworth's theory has had and continues to have a major impact, both in research and in practice, thanks in part to Ainsworth and Wittig's Strange Situation and the other attachment measures which were later developed. While research has shown that Bowlby was correct in highlighting the important role of early family experiences and parent-child relationships in influencing children's later psychological development; it seems that his claims may have gone beyond the evidence available at the time, and evident that perhaps he overestimated the universality and irreversibility of the damage to later health (Rutter, 1981; 1985). Studies of resiliency, children deprived of maternal care during the apparently "critical period" who developed into well adjusted children, adolescents, and adults, have created conflict for Bowlby's claims of continuity and a critical period (Rutter & Quinton, 1984; Clarke & Clarke, 1976). In a study relating attachment classification at infancy and subsequent childhood behavior problems, Lewis et al. (1984) found inconsistent and weak support for the association and concluded that "infants neither are made invulnerable by secure attachments nor are they doomed by insecure attachments to later psychopathology" (p. 123).

The long term stability of secure early attachments is not known but available data from short-term longitudinal studies, retrospective recall from adolescsents and adults, and

from intergenerational studies of high-risk populations suggests that the experience of secure early attachments makes it more likely that a child will grow up with feelings of high self-esteem and self-efficacy and establish secure future attachments (Rutter, 1987; Werner & Smith, 1982).

In contrast, insecurely attached children are deprived of the stable relationships which provide them with the ability to empathize, cope adaptively with anxiety, communicate freely and coherently, and develop moral reasoning. As a result, many studies have found insecure early attachments associated with subsequent maladaptive outcomes such as: low ego resiliency (Matas et al., 1978); lower self-esteem, low popularity, lack of empathy, social incompetence with both peers and adults, and higher dependency (Sroufe et al., 1983); and because of an inability to communicate coherently and accurately interpret and attribute motives behind others' behavior, aggressive/antisocial behavior (Suess et al., 1992; Troy & Sroufe, 1987; Sroufe, 1983).

Despite all of the apparent support for the continuity of maladaptive insecure relationships throughout the lifespan, one must remember that this research and its findings are correlational in nature and as a result, there are deficiencies in the available evidence. First, the cases that do not support continuity go unrecognized and are deemphasized because only those that can demonstrate the relationship tend to get noticed and are of interest for most researchers (also known as the "file drawer" problem).

Second, support for the relationship is also weakened by the fact that the nature of the relationship is unknown. There are no demonstrated direct links between insecure attachment in infancy and subsequent maladaptive functioning. Because of the enormous potential for mediating variables across development, at best we can say that the relationship is an indirect one. In fact, associations have been obtained almost exclusively in studies wherein stability in caretaking circumstances (good or bad) has existed. Therefore as stated by Lewis (1980), it is not reasonable to attribute differences in child performance to early

attachment patterns: Differences in child behavior could possibly be attributed to the quality of the current child-parent relationship. Resiliency studies, characterized by the lack of stability in caretaking circumstances (where the child often experiences negative environmental factors during the "critical period" and then improved caretaking circumstances during later childhood without any apparent lasting negative effects) not only conflict with the continuity and critical period assumptions, but support the hypothesis that it is the recent rather than the early patterns of child-parent interaction that may be the basis of observed differences in follow-up assessments. By comparing the predictive power of longitudinal relationships of attachment status and subsequent functioning, and the concurrent relationship of attachment status and functioning, support could be provided for either the epigenetic or the social network model.

A third, and related, problem is that typically attachment quality is measured only once at the beginning of a study, and the dependent variable (some aspect of functioning) is also measured once, at a later point in time. As a result any assumptions about the direction of the effects or the predictive relation is only speculative (Lewis, 1980). This problem could be mediated by measuring both constructs on at least two occasions.

Finally, as previously mentioned, a number of studies investigating the association between early attachment and subsequent functioning have produced conflicting results (Lewis et al., 1984). Attempts to replicate studies which identify the association have failed (Levitt, Anonucci, & Clark, 1984), and numerous studies have produced only weak or partial support, or no relationship at all (Erickson & Farber, 1983; Bates et al., 1985). At last, because attachment status has been used to predict such different aspects of functioning, in a variety of domains, using different methods, focusing on various developmental stages, and with varying and often conflicting results, we still are not clear what it best predicts.

Summary and Purpose

Despite the wealth of available attachment research, there have been relatively few attempts to unify and summarize those findings which either confirm or do not fully support the relationship between attachment quality at infancy and its subsequent effects on psychological functioning. Despite the numerous studies which do not support the continuity claim, their impact is almost neutralized by the "apparent" wealth of evidence supporting the continuity or epigenetic model put forth by attachment theory. Because of the previously mentioned deficiencies in available evidence supporting continuity, along with the conflicting evidence from studies demonstrating discontinuity, confusion exists with regard to the predictive implications of individual differences in attachment. For example, there are effects of early attachment status on subsequent behavioral problems at 4 years, but then another replication study which claims the effect is only significant for boys, and yet another states that there is no effect at all! Meanwhile some studies investigate the relationship longitudinally, some retrospectively, others concurrently, while a different group of researchers investigates attachment construct stability across development. Ultimately, there is a lack of clarity, and a more comprehensive and systematic approach toward making sense of the available evidence is warranted.

The objective of the proposed study is to investigate the extent to which attachment status relates (both concurrently and subsequently) to psychological functioning in the cognitive, behavioral, and socio-emotional domains. The method of choice for this study was a meta-analysis. A meta-analysis involves taking a large number of studies from the literature in a particular area and statistically re-anlayzing the findings to determine the size of an effect. Thus the overall goal is to reach a conclusion. The focus was on published studies reporting attachment status and its relation to psychological functioning due to the following: (a) the contradiction and ambiguities in the research literature, (b) the difficulty in determining if there is a predictive relationship between attachment status and subsequent

functioning given narrative reviews, (c) the difficulty in determining which aspects or domains of functioning (if any) are best predicted by attachment status from the literature review, (d) the relatively unknown nature of the stability of the attachment construct across development, (e) the urgency of determining risk factors associated with insecure attachments, and (f) the belief that policy directing the planning for family welfare requires that available research results be analyzed as an aggregate.

The practical implications of attaining such an overall conclusion in this area are signifiicant and far reaching, potentially influencing social policy. If the results support the notion of continuity and the concept of a critical period for attachment formation, then more effort and funding could be placed into early intervention programs and social support agencies for dyads at risk of insecure attachments. Conversely, if the results support the notion of discontinuity/reversibility then more attention could be given to the role of teachers, peers, and agencies such as Uncles At Large, as potential secure attachment figures for children and adolescents who have insecure attachment histories.

Finally, the role of the clinician would be given more support. The patient-therapist relationship could be the first secure attachment for individuals who have been deprived of one. The therapist would provide a secure environment for the patient to explore and readjust his/her early insecure internal working model. At present, many therapists have already been applying aspects of attachment theory to their patient relationships. However, as long as the epigenetic view is maintained, the experience with people beyond the primary caregiving relationship, while potentially important, is difficult to justify. If all subsequent relations and quality of functioning depend on the mother-child relationship and if that relationship is characterized as insecure, then there is little hope to alter the course of development. Therefore, the concept of reversibility/discontinuity is an optimistic view point which implies greater flexilibility in the course of development since the mother-child relationship is important but not the prototype for all other social relations.

In order to reach such a conclusion the first stage of analysis must establish what the available evidence supports with regards to the stability of individual differences in attachment status and its consequences on psychological functioning. There is a need for a quantitative review and synthesis of the research literature.

CHAPTER 3

Methodology

The effects of individuals' attachment status on the adaptive quality of behavioral, cognitive, and social emotional functioning (as well as attachment pattern stability) will be investigated through a meta-analysis of the published research literature. The association between early childhood relationships (attachment relations in particular) and subsequent adaptive development has long been the focus of psychological research studies. However, because this research area is so vast, complex, and rife with various methodological concerns associated with developmental studies, the numerous investigations have not resulted in conclusive answers. Confusion arises because attachment is a developmental theory and therefore these studies look at attachment in relation to various areas of functioning (cognitive, social, emotional, physiological & behavioral), at different stages of development (infancy, childhood, adolescence, and adulthood), and from different perspectives (longitudinally, and concurrently). As a result, these studies viewed as a whole appear to suggest that attachment status does indeed relate to both concurrent and longitudinal adaptive functioning but to what degree, and which specific aspects of functioning at which stages of development are vital questions which still require clarification. Narrative reviews attempt to provide some resolution to these matters. The procedure however is qualitative in nature and therefore reviewer subjectivity opens them to problems such as: study selection bias, biased interpretation of study results, infallibility. A scientific, more objective method of reviewing is required to gather, process, analyze, and synthesize the wealth of research results that have accumulated in this area.

Meta-Analysis

A solution to the quest for an overall conclusion based on the research literature, which simultaneously resolves many of the potential problems associated with a narrative summary, is a meta-analysis. This method elevates the narrative review by applying the scientific method to the gathering, processing, synthesizing, and reporting of data as well as the application of modern statistical methods. Individual research studies apply this method of "disciplined inquiry" and proceed through a series of stages: problem formation, data collection and evaluation, data analysis and interpretation, and final report (Shulman, 1986). Likewise, meta-analyses continue through these stages much like individual studies. The exception is that data points are no longer acquired from individual subjects as they are in original research, but are now obtained from individual studies. In other words, a study represents a subject (Russell, 1994). A meta-analysis consists of gathering a body of research studies and extracting quantitative indices of study characteristics and effect magnitude for each individual study (Hedges, Shymansky, & Woodworth, 1989). The data is then statistically analyzed resulting in a statistical statement about the overall magnitude of effects (Kulik, Kulik, & Cohen, 1979).

As ideal as a reviewing technique as it may seem, there are some potential problems for a meta-analysis. First, there is a concern that conclusions cannot be drawn from synthesizing and comparing the results from a breadth of studies which employ different measures, differing operational definitions of a construct or variable, and different samples. The problem of combining of incommensurable evidence is often referred to as the case of "apples and oranges" (Hedges et al., 1989). This criticism is addressed by recognizing that although broad constructs and operations are necessary, their associated problematic potential can be minimized by the meta-analyst distinguishing variations of the constructs and operations in the data analysis and in the presentation of the results.

Second, is the criticism that not all of the studies are designed equal. Some studies are well designed and others poorly, and thus by combining studies of variable quality it could result in distorted conclusions. This concern could be reduced by coding the studies' design quality and then assessing if the results differ for quality of design.

Third, is the problem which concerns any research, meta-analysis included, and that is sampling bias. It is almost unavoidable, but is of particular concern for narrative literature reviews because an unsystematic literature search is often used. Meta-analyses employ a systematic literature search with the principal tools being the computerized abstracting and indexing services for the social sciences. A related problem unique to research reviews (statistical and narrative) however, is publication bias. By including only published journal studies in a review, the research is made susceptible for obtaining a sample of studies biased toward significant findings. Thus the sample is not representative of the population of studies which have investigated the research question. This is commonly referred to as the "file drawer problem" because studies yielding statistically insignificant results are less likely to be published. A method for determining the effect of publication bias is to compare published effect sizes with those from unpublished sources (conferences, theses, and dissertations). It is important to note that any differences found between the sources is likely to be confounded with other study characteristics (e.g. design quality) (Hedges, Shymansky, & Woodworth, 1989). An alternative method for managing the problem of publication bias is the use of a statistical correction technique for estimation of effect size under publication bias.

Fourth, by including multiple results from the same study renders the data nonindependent and increases the probability of Type I errors (Russell, 1994). This problem could be managed by a number of alternative methods: a) each result could be treated independently in the analysis, b) the number of results taken from each study could be limited, c) all of the results from the same study could be averaged.

A final concern is that although meta-analysis is far more systematic and less subjective than a narrative review, it still involves substantial decision making which is highly subjective to the reviewer. This problem could be minimized by the reviewer including his/her parameters and definitions in the report. Furthermore, procedure reliability could be demonstrated by selecting a sample of studies and having two or more coders independently code, thereby establishing "intercoder" reliability.

Despite the outlined concerns, the advantage of a meta-analysis over traditional narrative reviews is that it does provide a more systematic and analytic method for summarizing the research literature. By including the parameters upon which the studies outcomes and claims are based, it becomes a review technique which can be evaluated and replicated. This feature of the procedure, in addition to those previously mentioned, permit the meta-analytic review to serve as the springboard from which social implications can emerge.

Definition of Terms

Attachment will be defined as formulated by Bowlby's theory, as referring to an intimate relationship with a significant other. It assumes that the internal working models formed in infancy with the primary care-giver are stable throughout development, and therefore attachment relations which will be included are not only those of infancy and childhood, but also those of adolescence and adulthood. Longitudinal attachment (continuity) is defined as any study which investigates mother-child attachment quality and its effects on subsequent developmental functioning over time (minimum 4 months). Longitudinal studies include retrospective methods such as the use of Adult Attachment Interview (AAI) (Gerorge, Kaplan, &Main, 1985). Concurrent attachment studies look at the association between the quality of attachment relationships and adaptive functioning simultaneously at one point in development. Stability is defined as a longitudinal measure of attachment quality at two points in time. Finally, psychological functioning will consider

adjustment in the following domains: cognitive, socio-emotional, and behavioral. "Behavioral" will be defined as any reference to overt behavior other than that which is clearly social (i.e., play behavior with peers). "Cognitve domain" will be defined as functioning in areas which are of an intellectual nature (i.e., formal reasoning). "Socio-emotional" will refer to functioning which is unmistakably social or emotional in nature (i.e., peer relations, empathy), as well to aspects of social-cognition (i.e., self-concept).

Literature Search

The literature search method entailed a systematic computer inspection of abstracting and indexing databases (PsychLit, PsychAbstracts, Sociofile, Eric, dissertation abstracts, and Medical abstracts), manual journal searches, conferences, and examination of reference lists from selected articles and reviews. By including psychological, medical, and educational data bases the search was intended to be interdisciplinary. This approach was considered appropriate because a strengths of attachment theory is that it draws upon and interests an audience from interdisciplinary areas. Key words used in the computerized database searches include: attachment combined with psychopathology, development, adaptive, functioning, insecure, quality, patterns, associated with, related to, correlated/tion, middle childhood, infant/mother, adolescence, adolescent, adulthood, and Adult Attachment Interview. Information from unpublished sources was deficient and mostly irrelevant, with the exception of one poster presentation at the Clarke Institute's October 1994 Attachment and Psychopathology Conference held in Toronto, Ontario. This study, entitled Early Deprivation, Attachment and Behavior Problems: Romanian Adoptees in Ontario by Gold, Goldberg and Marcovitch (1994) met the inclusion criteria and therefore is the only unpublished (presently) study included in this meta-analysis.

Criteria for Inclusion of Studies

Criteria for inclusion of studies in this thesis were based on articles investigating the relationship of attachment security and psychological (cognitive, behavioral, and social

emotional) functioning, both longitudinally and concurrently, as well as those investigating the stability of attachment quality patterns throughout development. Attachment security studied in the articles were required to meet Bowlby's definition of attachment relationships.Thus, investigated attachment security must have referred to that which developed from the infant-caregiver relationship. The exception to this criteria being that in the concurrent attachment studies a Bowlby-based attachment definition was required when investigating the security of adult intimate relationships. Ninety-two studies met the following parameters: (1) sample sizes greater than 20 subjects; (2) measures of attachment security and cognitive, behavioral, social-emotional, and/or attachment stability; (3) longitudinal studies of at least four months in duration; and (4) studies that employed psychometric measures (i.e., standardized measured instruments, observation techniques, checklists, rating scales, etc.).

The "dependent variable" in the meta-analysis is the effect sizes of the various studies. The "independent variables" consist of 15 factors which were classified according to a coding scheme under the following categories: year of study, number of subjects, statistic that was employed, whether attachment status was being related to adaptive or maladaptive functioning (the valence of the study +/-), study design (control group/no control), the existence of gender effect, age of subjects at the end of longitudinal study, longitudinal behavioral functioning, longitudinal cognitive functioning, longitudinal socio-emotional functioning, longitudinal stability, age of subjects in concurrent study, concurrent behavioral functioning, concurrent cognitive functioning, and concurrent socio-emotional functioning.

The magnitude of the effect for each of the dependent variables was calculated from correlations, Chi-square, kappa, Fisher's exact, and t and F ratios. Once the statistics were coded, the effect size of each study was calculated based on the equations presented in Table 2 . Effect sizes for percentages were developed from a table on probit transformation of

difference in proportions to effect size (Glass, McGaw & Smith, 1981) and longitudinal stability rates for attachment patterns were calculated starting at the 0% level.

Analysis

The data analysis was comprised of three sections: (1) descriptive statistics for coded variables, (2) determining effect size in the 7 domains, and (3) investigation of the relationship between study characteristics and effect size employing Chi-square contingency table analysis.

CHAPTER 4

Results

Results are presented under four main headings which include (a) descriptive statistics for study characteristics, (b) effect size analysis, (c) study characteristics and effect size, and (d) interpretation of the effect size. The first section provides: (a) descriptive characteristics of the studies in the sample (Table 4), and (b) the number and percentage of studies employing various methods of assessing adults' and childrens' attachments (Table 5). Section 2 presents the effect size analysis for the seven domains: (a) longitudinal behavioral, (b) longitudinal cognitive, (c) longitudinal socio-emotional, (d) stability of attachment classifications, (e) concurrent behavioral, (f) concurrent socio-emotional, and (g) gender effect (Table 6). Section 3 presents Chi-Square Analysis of variables potentially affecting effect sizes in the seven domains (Table 7).

Several statements below make an assertion about a percentage of studies in the meta-analysis. It is important to distinguish between those percentages for which the denominator is the full set of 92 studies, and those for which it is the number of studies which reported the relevant information. For example, consider two variables: Study Statistic, and Control Group Size. Every study had a value for Study Statistic, however only 18 studies reported a control group design. Thus we can say that 44.6% of the studies employed the F statistic (41 of 92), and since 13 studies had control group sizes of less than 34, 55.6% (13 of 18, not 13 of 92) of the studies had control groups of less than 34 subjects.

Descriptive Statistics for Study Characteristics

The mean sample size for the ninety-two studies in the meta-analysis was 111 subjects (SD=150), with the smallest and largest studies containing 24 and 935 subjects respectively. The analyses were based on an overall sample size of 10,269 subjects for the total across all studies. The range of publication was from 1977 to 1995, with 14% of the studies clustered in the first seven years of publication, and 86% within the past 12 years. Fourty-five percent of the total number of studies were published between 1990 and 1995.

Descriptive Characteristics of Studies in the Sample

Some of the descriptive characteristics used in the meta-analysis of the 92 studies are presented in Table 4 (i.e.,year of publication, sample size, motive for the research, study design, age categories of subjects at the end of the longitudinal studies, age categories of subjects in concurrent studies, the valence of adaptive functioning in studies related to attachment status, gender effect).

Sixty-six of the 92 studies were of longitudinal design and 26 were concurrent. Of the 66 longitudinal studies 54% were pure longitudinal, 20% were retrospective longitudinal, and 26% were longitudinal stability studies. The age distibution of the subjects at the completion of the longitudinal design was approximately 20% in the infant category (less than or equal to 2 years), 14% in the toddler group (2 to 3 years), 25% preschool (4 to 5 years), 12% middle childhood (6 to 12 years), 11% adolescents (13 to 21 years), and 12% adult (over 21 years). In the concurrent design studies the age distribution was approximately as follows: 8% infant, 8% toddlers, 23% preschoolers, 19% middle childhood, 31% adolescents, and 11% adults.

The objective of research was to investigate the relation between attachment status on both concurrent and subsequent functioning. Almost half (54%) of the studies focused on social-emotional functioning, 25% assessed behavioral functioning, 20% looked at stability

of attachment status over time, and 1% focused on cognitve functioning. The valence of the associative relationship between functioning and attachment status was clustered into the following categories: 40% adaptive, 32% maladaptive, and 28% neutral. The adaptive functioning valence accounted for 37 of the total 92 studies and was comprised of studies relating secure attachment status to the most well represented areas such as peer social competence (13), postive self concept (8), adaptive adult relations as both parent and intimate partner (4), emotional openness (2), adaptive college psychological functioning (2), and play competence (2). Also falling into the adaptive functioning valence category were individual studies which investigated secure attachment status and adaptive social perception, cognitive functioning, empathy, fluency of discourse, general socio-emotional functioning, and overall functioning.

Maladaptive functioning was the focus of 29 of the 92 studies relating insecure attachment status to areas such as behavior problems (10), psychopathology (8), suicide attempts/ideation (2), poor adult relations (2), asthma (2), as well as, failure to thrive, maladaptive socio-emotional functioning, overdependency, victimization, and fear of strangers. The remaining 26 studies were neutral in valence, focusing mainly on the stability of attachment status (18), intergenerational transmission of attachment relations (6), and attachment status relating to social (3) and behavioral (1) development.

Gender effect was reported in 14 studies. In 57% of those studies, the effect was significant for males. Within those studies, male gender effect occured in the Behavioral domain three times, once with a neutral valence related to mother-child interaction during the first three years, and twice with a maladaptive valence relating to aggression and anti-social behavior. Gender effect also favoured males in studies in the Socio-emotional domain (5 instances). In four of these cases the effect occured with the adaptive valence in relation to adult couple relationships, peer behavior in preschool, and twice relating to social competence. The other instance of the male effect in this domain reflected the malaptive

valence in relation to psychopathology. Significant gender effect for females was noted in 6 studies or 43%, all within the Socio-emotional domain. Four of these instances were with an adaptive valence in the areas of peer competence, adult couple relationship stability, and college social and psychological functioning. The other two cases of the female gender effect were related to maladaptive socio-emotional functioning in studies investigating fear of strangers and anxiety disorders.

Number and Percentage of Studies Employing Various Methods of Assessing Attachment

Multiple methods of assessing attachment status were employed in the studies, sometimes within the same investigation (see Table 5). The Strange Situation procedure was the most common form of assessing attachment, representing almost half (49%) of the methods. Due to the limiting nature of this method with respect to its validity in assessing individuals beyond toddlerhood, 18 studies (15%) employed modified versions of this procedure. This included the following modified procedures: the 6-year old versions developed by Main and Cassidy (1988) and Marvin (1972), in which longer separations occur and both dyadic physical and verbal interactions are rated; Cassidy and Marvin (1989), which is a three and four-year-old classifcation system involving dyadic free play, and a short (3 minutes) separation and reunion; Kaplan and Cassidy (1987) picture separation procedure, where attachment representations of 6-year-old children are classified based on their discussion of a set of pictures portraying different parent-child separation experiences. These modified methods of the Strange Situation have been validated and have been found to correlate highly with attachment classifications made in the Strange Situation at age 12 months and with concurrent measures of attachment at age 6 years based on reunion to their mothers (Main et al.,1985)

The Adult Attachment Interview was the method used in 10% of the studies. As a measure of assessing adult attachment it was often employed in investigations of the

association between parent attachment classification and infant's classification in the Strange Situation. Armsden and Greenberg's (1987) Inventory of Parent and Peer Attachment, a self report measure for use with adolescents, represented 7% of the methods reports in the studies. The Parental Bonding Instrument (PBI) (Parker et al., 1979) was employed twice, representing 2% of the methods in the studies. PBI is a brief self-report instrument designed to characterize relations with each parent during the first 16 years of life in terms of two dimensions: affection and control. The Waters and Deane (1985) Attachment Q-Set was also used in two studies and it is a set of descriptive statements relating to attachment behavior which an observer sorts into piles which best describes a target individual's behavior. The validation of this method vis-a-vis the Strange Situation has been established in two studies (Waters 1987; Bosso,1985). Finally, an "Other" category was created for methods used in studies which were not established procedures, these included interview methods, questionnaires, surveys, rating scales, and archival case history data.

Effect Size Analysis

It is important to note that when negative correlations were incorporated into the effect size, this calculation influenced the results of the descriptive statistics (i.e.-mean, SD, and range). Thus instead of contributing to the mean effect size of a particular domain they were actually detracting from it. However, because there are relatively few cases (7 instances) of negative correlations and they are evenly dispersed across the domains they were not adjusted.

Behavioral Domain (Longitudinal)

Longitudinal behavioral measures included behavior problem checklists; behavioral observation in play, with strangers, and during discourse; its stability over time, and its transmission across generations. Results indicated that the quality of attachment established in early childhood is associated with both subsequent adaptive and maladaptive functioning. In addition, the results provide support for the continuity and intergenerational transmission of attachment status and its associated behavior development (effect size =.58). Minimum and maximum range of the effect size was -0.54 and 1.59 (see Table 6).

Cognitive Domain

There was only one study which investigated within the cognitive domain. In this longitudinal study, attachment representations were assessed at age 7 and then cognitive functioning was measured at ages 7,9,12, 15, and 17 years. Results were based on performance on a battery of Piagetian tasks assessing concrete and formal reasoning, and suggested that children with secure attachment were favored in their cognitive performance in childhood and adolescence (effect size= .75) (see Table 6).

Social-Emotional Domain (Longitudinal)

In the longitudinal social-emotional domain, it was discovered that individuals with secure early attachment relations were subsequently found to be functioning more adaptively in the socio-emotional areas of social competence (parent, peer, & couple relationships), self-concept, emotional openess, and empathy. Similarly, insecure early attachment relations were found to be associated with maladaptive functioning in the areas of social competence (parent, peer, & couple relationships), and pathology in the form of failure to thrive, eating disorders, anxiety, depression, and suicide attempts.The effect size in this domain is 0.76 and ranged from a minimum of -0.46 to a maximum of 2.67. Further, there were a number of

cases which assessed the longitudinal relationship between attachment status and functioning in this domain for only one gender or separately by gender. The mean effect size for the four cases investigating the relation for males was 0.85, whereas for the five studies examining the relationship in women, the mean effect size was 0.61(see Table 6).

Stability

Stability assessments focused on concordance of attachment classifications (as assessed at two points in time) and their associated behavior patterns, as well as intergenerational transmission of attachment classifications assessed by the Adult Attachment Interview in conjunction with the Strange Situation. Support for stability of individuals' attachment status throughout development and transmitted across generations was provided (effect size = 1.93) (see Table 6).

Behavioral Domain (Concurrent)

Concurrent behavioral assessments focused on behavior problems, psychopathology, and play behavior. Individuals with insecure attachment status displayed a greater degee of maladaptive behavioral functioning, while those with secure attachment status displayed greater adaptive behavioral functioning (effect = .57)(see Table 6).

Social-Emotional Domain (Concurrent)

In this domain, studies focused on concurrent attachment status and its relationship to socio-emotional functioning with a focus on the following areas: social competence, self-concept, fear of strangers, and pathology (depression, anxiety, borderline disorder, suicide ideation, asthma, and eating disorders). Individuals with secure attachment were found to be functioning more adaptively in the socio-emotional domain than those with insecure attachment classifications (effect size = 0.69) (see Table 6).

Summary

The magnitude of the effect size increased from the behavioral (concurrent) to behavioral (longitudinal), to socio-emotional (concurrent), to cognitive, to socio-emotional (longitudinal), to the stability domain (.57, .58, .69, .75, .76, and 1.93) respectively. Longitudinal socio-emotional assessments were done in more studies (34) than were concurrent socio-emotional, stability, longitudinal behavioral, concurrent behavioral, and cognitive assessments (22, 20, 17, 9, and 1 studies respectively).

Study Characteristics and Effect Size

Chi-Square analysis of variables potentially affecting the effect sizes in the six domains revealed no significant differences for four possible mediating variables (see Table 7).

Interpretation of Effect Size

Results are consistent with predictions of attachment theory given the direction and magnitude of the effect sizes. Higher levels of insecure attachment are expected to produce deleterious effects within the socio-emotional, behavioral, and cognitive domains. On the other hand secure attachment is expected to provide more adaptive concurrent and subsequent functioning in these areas of development. Attachment classifications (and their associated working models) are assumed to be stable throughout development. Results of continuity of attachment status assessed longitudinally, retrospectively, and transmitted intergenerationally, confirmed those patterns predicted by attachment theory.

Further, the Chi-Square analysis indicated that four other variables thought to potentially mediate the effect sizes do not demonstrate any significant effects.

Tables

Table 1

Study Characteristics and Effect Size for the Seven Domains and Sex Differences

Author	Yr	Sz	Stat	+/-	Ctrl	Att 1 long	M/F	Beh	Cog	Soc-Em	Stab	Att 2 conc.	Beh	Soc-Em
*1	87	86	*r*	3	//////		0					223		1.81
2	90	107	*F*	1	52		0					156		.52
3	85	160	*r*	1	/////	36	0	1.59						
4	84	61	*F*	3	/////		0					12.5	.62	
5	94	96	χ^2	2	/////	*350	0				2.27			
6	89	50	χ^2	1	25	24	0			.92				
7	93	248	*F*	1	/////	*354	0			.80				
8	88	45	*r*	1	/////		0					18, 42, & 66	-.54	
9	88	52	*r*	3	/////		0					72		.87
10	92	125	χ^2	2	60	36 & 48	0				exp.= .98 con.= .91			
11	82	77	*F*	2	/////	30	F= .40 m	.59						
12	90	89	*F*	3	/////		F= .75 m					74	m= .73 f= .00	
13	92	27	*F*	3	/////	*402	0			m= 1.13 f= .80				
14	92	27	*F*	3	/////	*402	0			m= 1.17 f= .44				
15	88	64	χ^2	1	24	adult≅ *384	0			.95				
16	84	212	χ^2	2	/////	18	0				0.91			
17	85	96	*F*	1	/////	57	0	.66						
18	90	81	F	1	/////	48	F= .4	.00						

Auth.	Yr	Sz	Stat	+/-	Ctr l	Att. 1 long	M/F	Beh	Cog	Soc-Em	Stab	Att. 2 con	Beh	Soc Em
19	91	100	*r*	2	/////	*372	0	1.09						
20	85	38	χ^2	2	/////	20	0				.63			
21	94	82	*r*	1	38	43	0	.63						
22	90	69	*r*	1	/////	48	0	-.1						
23	89	71	*r*	2	/////	48	0	-.47		-.46				
24	90	84	*F*	2	33	2	0	0.00		0.00				
25	91	50	*r*	1	25		0 all m					51.75	exp= .65 con= 1.06	
26	92	40	*r*	1	20	*178	0			2.67		178		2.67
27	92	57	*F*	3	/////		0					130		.73
28	87 #1 #2	620 108	χ^2	2 2	/////	*432 *216	0				1.19 5.03			
29	94	84	*F*	2	/////	48	0			0.00				
30	94	85	*F*	3	/////	204	0		.75			84		F= 1.28
31	86	48	*t*	3	24	36	F= .89f			0.00 & .92*				
32	91	226	*F*	3	/////		F= .28f					216		f= .17* m= .27
33	92	230	*F*	1	162		0 all f					236		1.19
34	89	24	*F*	3	/////	48.7	0			.96				
35	94	354	*F*	3	/////		all f					276		m= .15 f= .30
36	88	53	*F*	3	/////	*218	0			1.73				
37	88	120	*r*	3	/////	*412	only * m			m= .51* f= .37				
38	85	40	χ^2	3	/////	54	F=.4 0 (f)			1.03				
39	90	253	*F*	3	/////		0					233		.23
40	84	113	*F*	1	/////	72	only * m			f= .44 m= .59				

Auth.	Yr	Sz	Stat	+/-	Ctrl	Att. 1 long	M/F	Beh	Cog	Soc-Em	Stab	Att. 2 conc.	Beh	Soc-Em
41	77	40	*r*	3	/////	43	0			.85				
42	81	36	*t*	1	/////	21	0	1.34						
43	85	49	*F*	2	/////	36	0	F=.79						
44	93	62	*r*	1	/////	60	0	-.54						
45	88	#1=33 #2=50	1=*k* 2=*k*	2	/////	#1=36 #2=37	0				#1=2.34 #2=1.07			
46	85	40	*r*	23	/////	#1=72 #2≈360	0	#1=1.03		#1=1.86 #2=1.01	#1=2.34			
47	81	#1=61 #2=44	1=*k* 2=*F*	2/3	/////	#1=20	0				#1=1.92	#2=12		#2=1.12
48	91	52	*r*	1	/////		0					85	1.13	
49	78	48	*F*	3	/////	24	0	.74						
50	94	218	1=*F* 2=$\chi 2$	3/2	/////	*221	0			#1=.42	#2=3.19			
51	87	43	1=$\chi 2$ 2=*F*	1	17							52	#2=1.17	#1=.68
52	88	59	*F*	3	/////	60	0			0.00				
53	89	66	*t*	3	33		0					48		.88
54	81	74	*F*	3	37	23	0			.93				
55	88	46	*F*	3	/////		0					54		.53
56	89	49	*F*	3	/////	60	0			.97				
57	87	101	*r*	3	/////		0					228		.49
58	92	935	*F*	1	/////		0					180	.46	.28
59	89	191	*r*	1	/////	96	t=.55	m=.54 * f=.08						
60	87	211	*r*	1	/////	*283	0			-.41				
61	85	148	*k*	2	77	24	0				exp=.30 c=1.25			
62	91	152	*r*	1	128		0					301		.79
63	93	47	*F*	3	/////	121				1.11				
64	83	40	*F*	1	/////	52	0			.83				

Auth.	Yr	Sz	Stat	+/-	Ctrl	Att.1 (long)	M/F	Beh	Cog	Soc-Em.	Stab	Att.2 conc.	Beh	Soc - Em.
65	90	82	*r*	1	/////		t= .48 f					30		-.67
66	90	191	*F*	1	/////		0					234		.59
67	92	39	1=χ2 2=χ^2	3	/////	5	0	#1= 1.43		#2= -.57				
68	82	43	%	2	/////	19.5	0				.72			
69	87	38	χ^2	1	/////	54	0			-.46				
70	91	40	*F*	3	/////		F= .85 m					48		.67
71	92	47	*F*	3	/////	121	0			.55				
72	79	100	*k*	2	/////	18	0				.63			
73	95	74	*k*	2	/////	*204	0				1.30			
74	94	40	*k*	2	/////	72	0				2.10			
75	78	50	*k*	2	/////	18	0				4.71			
76	79	#1= 45 #2= 32	1=*F* 2=*t*	3	/////	1= 24 2= 42	0			#1= .55 #2= 1.15				
77	93	246	*F*	1	136		F= .25 f					408		.76
78	93	60	*k*	2	/////	*360	0				1.59			

* The author number corresponds to the study as referenced in Appendix A

Notes to Table 1:

1. Studies marked with an asterisk in Att 1 column represent unorthodox longitudinal studies that are retrospective in nature.
2. Abbreviations in column titles: Yr- year of publication of study, Sz- number of subjects in study, Stat- statistic used in analysis, +/--- the valence of the research; whether investigating attachment in relation to adaptive, neutral, or maladaptive functioning, Ctrl- the existence of a control group in the investigation, Att 1 (long)- the age (in months) of the subjects at the end-point of the longitudinal study, M/F- gender-effect, Beh- behavioral domain, Cog- cognitive domain, Soc-Em.- social-emotional domain, Att 2 (conc.)- age of subjects at which investigating concurrent attachment status and functioning, Stab- stability of attachment status.
3. The number of studies is less than 92 because some studies provided more than one effect size.

Table 2

Formulae for Converting Study Statistics to Effect Size (d)*

Statistic to be converted	Formula for Transformation
t	$d = \frac{2t}{\sqrt{df}}$
F	$d = \frac{2\sqrt{F}}{\sqrt{df\ (error)}}$
r	$d = \frac{2r}{\sqrt{1-r^2}}$
X^2	$r = \sqrt{\frac{X^2}{n}}$
$\overline{X}$	$d = \frac{\overline{X}e - \overline{X}c}{Sc}$

*** Adapted from Wolf (1986), p. 35**

Table 3

Effect Size for Percentage of Attachment Classification Stability Based on Probit Trasformations*

Percent	Effect Size (d)
0-1	0.00
2-4	0.10
5-6	0.20
7-9	0.29
10-11	0.37
12-14	0.45
15-16	0.52
17-19	0.59
20-21	0.65
22-24	0.72
25-26	0.79
27-29	0.85
30-31	0.91
32-34	0.98
35-36	1.04
37-39	1.11
40-41	1.17
42-44	1.29
45-46	1.29
47-49	1.36
50-51	1.43
52-54	1.50
55-56	1.56
57-59	1.64
60-61	1.71
62-64	1.80
65-66	1.88

* Adapted from Glass et al. (1981), p. 139

Table 4

Descriptive Characteristics of the Studies in the Sample

Variable	N	Percent
1. Year of Publication		
1977-83	13	14.1
1984-89	38	41.3
1990-95	41	44.6
total	92	
2. Sample Size-		
N = 24 to 48	31	33.7
N = 49 to 85	31	33.7
N = 86 to 935	30	32.6
total	92	
3. Motive for the Research- Effects of attachment status on:		
cogntive functioning	1	1.0
social-emotional functioning	50	54.3
behavioral functioning	23	25.0
attachment stability over time	18	19.5
total	92	
4. Study Design		
Pure Longitudinal (from infancy)	36	39.1
Longitudinal Retrospective	13	14.1
Longitudinal Stability	17	18.5
Concurrent	26	28.3
total	92	

5. Age Categories of subjects at the end of Longitudinal Design		**13**	**19.7**
Infants (< 2 years)		**7**	**10.6**
Toddlers (2 to 3 years)		**16**	**24.2**
Preschooler (4 to 5 years)		**10**	**15.1**
Middle Childhood (6 to 12 years)		**8**	**12.1**
Adolescent (13 to 21 years)		**12**	**18.1**
Adult (> 21 years)		**66**	
total			

6. Age Categories of subjects in Concurrent Studies			
Infant (< 2 years)		**2**	**7.7**
Toddlers (2 to 3 years)		**2**	**7.7**
Preschool (4 to 5 years)		**6**	**23.0**
Middle Childhood (6 to 12 years)		**5**	**19.2**
Adolescents (13 to 21 years)		**8**	**30.8**
Adults (> 21 years)		**3**	**11.5**
total		**26**	

7. Gender Effect			
Significant for Males		**8**	**57.1**
socio-emotional adaptive	**4**		
socio-emotional maladaptive	**2**		
behavioral maladaptive	**1**		
behavioral neutral	**1**		
Significant for Females		**6**	**42.9**
socio-emotional adaptive	**4**		
socio-emotional maladaptive	**2**		
total		**14**	

8. Attachment Status Related to Functioning Valence:

Adaptive:			
peer social competence	13		
self concept	8		
adult relations	4		
emotional openess	2		
college psych functioning	2		
play	2		
overall functioning			
socioemotional functioning			
social perception			
cognitive functioning			
empathy			
fluency of discourse			
total =		37	40.2
Maladaptive:			
behavior problems	10		
psychopathology- (anxiety, depression, eating disorders, & borderline disorder)	8		
suicide attempts/ideation	2		
poor adult relations	2		
asthma	2		
failure to thrive			
socio-emotional functioning			
overdependency			
victimization			
fear of strangers			
total =		29	31.5
Neutral:			
stability	16		
intergenerational transmission	6		
social development	3		
behavioral development	1		
total =		26	28.2
Grand total =		92	100

Table 5

Number and Percentage of Studies Employing Various Methods of Assessing Attachment Status

VARIABLE	N*	Percent
1. Strange Situation	50	49.0
2. Modified Strange Situation	18	17.6
3. Adult Attachment Interview	10	9.8
4. Inventory of Parent/Peer Attachment	7	6.8
5. Parental Bonding Instrument	2	2.0
6. Attachment Q-Set	2	2.0
7. Other total Interview Questionnaire/Survey/Scale Archival case history data	13 3 9 1	10.8

*** Total N is more than 92 because many studies employed multiple methods.**

Table 6

Effect Size (ES) in the Seven Domains Assessed

Domain	Mean ES	# of Studies	N	Min ES	Max ES	SD
Behavioral (longitudinal)						
Male & Female	0.58	15	1094	-0.54	1.59	0.67
Male	0.54	1	106	-----	-----	-----
Female	0.08	1	85	-----	-----	-----
Cognitive (longitudinal)	0.75	1	85	-----	-----	-----
Socio-Emotional (longitudinal)						
Male & Female	0.76	23	1805	-0.46	2.67	0.67
Male	0.85	4	143	0.51	1.17	0.35
Female	0.61	5	122	0.37	1.01	0.28
Control	1.39	2	64	0.92	1.86	0.66
Stability of Attachment	1.93	18	1904	0.30	5.03	1.29
Control	1.48	2	117	1.25	1.71	0.32
Behavioral (concurrent)						
Total	0.57	5	1132	-0.54	1.17	0.69
Experimental	0.69	2	25	0.65	0.73	0.06
Control	0.53	2	25	0.00	1.06	0.75
Socio-emotional (concurrent)						
Male & Female	0.69	18	2764	-0.67	1.18	0.51
Male	0.21	2	230	0.15	0.27	0.08
Female	0.23	2	350	0.17	0.30	0.09

Table 7

Chi-Square* Analysis of Variables Potentially Affecting Effect Sizes in Five Domains

Variable	Behav 1 Total	Soc-Em 1 Total	Stability Total	Behav 2 Total	Soc-Em 2 Total
1. Year of Study Publication	NS** 2x3	NS 2x3	***	NS 2x2	NS 2x3
2. Statistic Used in Analysis	NS 2x4	NS 2x4	***	NS 2x2	NS 2x4
3. Assessment Method	NS 2x3	NS 2x3	***	NS 2x2	NS 2x2
4. Study Design	NS 2x3	NS 2x2	***	***	***

*** All analyses conducted on: 2x2 contingency tables have df = 1**
2x3 contingency tables have df = 2
2x4 contingency tables have df = 3
**** NS implies a nonsignificant level of significance of the Chi-Square test.**

***** Statistics cannot be computed when the number of non-empty rows or columns is one.**

CHAPTER 5

Discussion

Implications of Findings in the Context of Current Research

Current attachment research has gone in two directions: one, exploring the longitudinal relation between attachment status in infancy and its effect on subsequent psychological functioning and two, examining the concurrent links between attachment status and psychological functioning at later stages in development. Unifying these two lines of research have been studies which investigate the stability of attachment status throughout the course of development and its transmission across generations.

Results from these three lines of research have provided highly substantial evidence for the stability of attachment classifications throughout development and across generations, as well as significant support for both concurrent and longitudinal relations between attachment status and functioning. The effect sizes across the three domains of functioning (socio-emotional, behavioral, and cognitive) varied in the level of significance, some appeared very significant, while others appeared more moderate. A possible explanation as to why the predictive power only appeared moderately significant in some domains is because of the substantial number of cases of discontinuity. Some of the reasons for this apparent discontinuity have previously been mentioned in the review of the resiliency literature, but other factors include: the aspect of functioning within a domain that is being investigated, the socio-economic status of the samples, gender effects, as well as various methodological issues.

Although psychological functioning incorporates the domains of social, emotional, behavioral, and cognitive development, the strength of the attachment/functioning relationship varies not only between domains but particularly within domains. It is this disparity in predictive significance between aspects of functioning within the same domain that results in the moderate predictive power for the domain as a whole. In the socio-emotional domain for example, maternal attachment status has been shown to powerfully predict peer social competence in preschool (Waters et al., 1979; Sroufe, 1983; La Freniere & Sroufe, 1985; Troy & Sroufe, 1987; Cohn, 1990; Turner, 1991), but this effect has not been reliable. Howes et al. (1994) found that early maternal attachment did not predict later peer competence at all. Similarly, Jacobson and Willie (1986) found that although early attachment history did not predict sociability or responsiveness to peers, it did predict the type of responses directed to the child by the peers. In all fairness, these three studies did not share the same measures, procedures, or samples. The La Freniere and Sroufe sample was a low socio-economic status (SES) sample and Howes et al. consisted of relatively advantaged families. However, while the SES in the Howes et al. sample was similar to that of the Waters et al. sample, the children in the Howes et al. sample entered peer groups at earlier ages that those in the other sample. This is important because peer experience is associated to social competence with peers (Howes, 1988). Despite this difference, it is noted by Howes et al. that the few children in their sample who were new to child care as 4-year-olds did not appear different in relations between peer competence and maternal attachment quality than those children in the sample who had more child care experience. Still, Howes et al. and Jacobson and Wille' s studies differed in that familiar peers were used in the former and unfamiliar peers were used in the latter. Furthermore, in Howes et al., unlike in Cohn (1990) and Turner (1991), concurrent maternal attachment status was found to be unrelated to peer competence. However in all fairness, although identical maternal attachment quality assessments were used in the Howes and Turner studies, 4-year-old maternal attachment

status was measured differently in the Cohn study. Combining these disparate findings results in moderate predictive power in the socio-emotional domain. Clearly more research, replication in particular, is required to resolve these discrepancies.

Current attachment research has shifted focus to attachment status beyond childhood and its impact on concurrent functioning. An area of interest for many of these researchers is how attachment status relates to psychopathology. Unfortunately most of the findings from these studies are weakened because the majority involve concurrent relations, which don't answer the "chicken or egg" question of which came first-- the inability to form secure attachment or psychopathology. West, Rose, and Sheldon (1993) examined the relevance of insecure attachment to the differentiation of psychiatric outpatients from nonpatients and found that their three components of insecure attachment (feared loss of attachment figure, proximity seeking, and separation protest) served as a clinically relevant system for distinguishing outpatients from nonpatients. While unable to make any argument for causality, their discussion focused on the clinical application of this insecure attachment measurement when developing therapeutic interventions and evaluating outcome. Although this study provided findings which potentially benefit clinical therapy, it provides no implication with respect to the causal pathways between early attachment quality and current pathological functioning. Despite the support for stability, the issue that the individual's mental state, particularly a pathological one, potentially affects their current attachment status regardless of the quality of their early parent-child relationship cannot be overlooked. Although not always practical, a longitudinal line of inquiry is required to resolve this matter.

Implications of Present Findings

Results of the meta-analysis indicate that the quality of attachment status significantly predicts the quality of both current and subsequent functioning in the cognitive, socio-

emotional, and behavioral domains. Further, it is evident that this predictive relationship applies across the lifespan and into old age. The finding that the largest effect was for attachment status in relation to socio-emotional functioning rather than behavioral functioning is consistent with attachment theory. This result is expected because attachment is inextricably tied to social relationships and emotions via the internal working model's representations of "self" and "other". Furthermore, it is not all that surprising that only one study investigating the connection between attachment and cognitive functioning appeared, because aside from the more socially and emotionally influenced aspects of cognition (i.e., self concept, social attribution, etc.), one would not expect to find a relation. Nevertheless, in the single cognitive study investigating the longitudinal relationship between attachment and formal reasoning ability, Jacobsen, Edelstein, and Hoffmann (1994) found that children with a secure attachment representation were favoured in their cognitive performance in childhood and adolescence. Cognitive performance in this case was defined by achievement on a battery of Piagetian tasks assessing concrete and formal reasoning. Additionally, it was found that those with an insecure disorganized attachment were particularly disadvantaged in deductive reasoning tasks. It is important to note however, that once the role of self confidence was partialled out of the effect, it became apparent that it had significantly mediated the effects of attachment representations on cognitive functioning. Despite this caveat, further investigations focusing on attachment status and cognitive functioning are recommended.

The reported gender differences appear to be evenly divided among males and females with no apparent interactional pattern occurring between gender effect and particular domains of functioning or with valence of functioning. Thus, some studies found a gender effect for women, where the relationship between attachment and functioning was more significant for women, and others found the results more significant for males. As a result, these gender effects are difficult to interpret and provide no viable hypothesis.

Further, because so few studies even investigated gender differences in a research area which provides vital information for adaptive development, more research into the role that gender plays in the attachment/functioning relationship is mandatory. Of those studies that did investgate gender differences, 14 reported the gender effect. This finding indicates that the majority of results in the current body of attachment literature should not be generalized across gender because in doing so, the true effect of attachment status on psychological functioning for each gender could be masked..

Finally, support is provided for the stability of early attachment patterns across the lifespan by: (a) the evidence demonstrating the continuity of an impact on subsequent functioning, (b) its appearance in the retrospective and short-term stability studies, (d) the intergenerational transmission of attachment styles, and (d) the finding that the effect sizes which examined the relationship longitudinally were equally as large as those which looked at the concurrent relationship. That attachment patterns persist through childhood into adulthood and across generations is not so surprising when one considers that the early environment most children start out with does not change, or that once formed, internal working models often become self-fulfilling prophecies. Whether this continuity truly reflects some particular style of the individual, formed during the critical period, or the persistence of environmental features that influence functioning, is an issue which cannot be easily resolved. However the apparently conflicting nature of the evidence found in this meta-analytic study appears to suggest that both may apply to some extent.

A summary of the present findings is similar to that stated earlier at the conclusion of the literature review. Information in the literature and within this study indicate that a secure attachment relation appears to acts as a protective mechanism, making current and subsequent adaptive psychological functioning more likely. Conversely, there is moderately significant evidence suggesting that insecure attachment makes one more vulnerable to stress, and thus may increase the risk for pathological functioning. The evidence is

correlational in nature and any suggested causal relationship is of an indirect nature, appearing to be mediated by: (a) gender, (b) socio-economic status (SES), (c) genetic or temperamental traits of the individual, (c) features of the environment, (c) attachments to those other than the initial primary caregiver, (d) later experience.

The results of this study with regard to the impact of early childhood relationships on subsequent functioning emerge providing more support for the epigenetic view of attachment than for the social network view. However, the epigenetic view which is supported is not like the rigid Freudian one which assumes the existence of a direct relationship from one set of social experiences to the next. For a Freudian, adult psychopathology is viewed as necessarily indicating the regression to infancy or the fixation at some earlier psychosexual stage. The epigenetic view supported by this study is a more moderate one which involves the continual construction, revision, integration, and abstraction of attachment mental models. It is congruous with the possibility of change based on new experiences and information, although change is considered more difficult with repeated use of internal working models (Hazan & Shaver, 1987). The differentiation between these two extremes of the epigenetic view is best illustrated in this paragraph which compares Freud and Bowlby's views on the unconscious.

> Freud argued his case beautifully, if not persuasively, by likening the unconscious to the city of Rome, which has been ravaged, revised, and rebuilt many times over the centuries. In the case of the unconscious, according to Freud, it is as if all the previous cities still exist, in their original form and on the same site. Bowlby's conception is more in line with actual archeology. The foundations and present shapes of mental models of self and social life still bear similarities and connections to their predecessors- some of the important historical landmarks, bridges, and crooked streets are still there. But few of the ancient structures exist unaltered or in mental isolation, so simple regression and fixation are unlikely. (Hazan & Shaver, 1987, p.523).

Interestingly, even from this quote one can see how interpretations of Bowlby's original views of attachment continuity differ from one attachment researcher to the next. In this

case, the researcher interprets Bowlby's theory as incompatible with the concept of critical period, whereas others such as Lewis (1980) portray the theory as congruous with the notion.

Thus, it appears that there are three developmental models that can be used to explain the attachment and functioning relationship: (a) child attributes, (b) environmental attributes, and (c) the interaction/transaction of both sets of attributes (Lewis et al., 1984). The child attribute model is compatible with the critical period concept and similar to the rigid epigenetic view held by Freud. It views early attachment security as a trait or predisposition which the child acquires from the attachment relationship. This view ignores the impact of the later environment and because the research suggests that attachment status is stable as long as the environment remains stable, this model seems less than adequate.

The second model proposes that the quality of a child's functioning is dependent on the environment conditions. In contrast to a trait, the quality of a child's functioning remains stable only as long as the environment supports that quality. Thus similar to the view held by Kagan, it assumes that secure attachment and subsequent adaptive functioning are no more than measures of a healthy environment at two points in time.

The third model asserts that both the child attributes and the character of the environment are required to predict the quality of an individual's functioning. Continuities and discontinuities are a function of both elements. Thus an infant who is securely attached will demonstrate subsequent adaptive functioning as a result of both the early secure attachment and the quality of the environment at a later age (Lewis et al., 1984). However, the question remains whether the attribute interacts with the current environment and results in a new quality of functioning, or whether the attribute itself is changed by the current environment, and therefore results in a new quality of functioning. The first hypothesis is congruent with the interactional view (Lewis, 1972), while the second is comparable to the transactional view (Sameroff & Chandler, 1975). These two views can

best be illustrated by applying them to the relation of attachment and functioning. The interactional view would claim that a securely attached child at time t^1 shows subsequent maladaptive functioning at time t^2 because the secure attachment at t^1 has interacted with a negative environment at t^2 to produce maladjustment. In contrast, the transactional view would claim that the previously securely attached individual who now demonstrates maladaptation is the function of the secure attachment at t^1 interacting with the poor environment at t^2 and producing an insecure attachment at t^2 which in turn results in maladjustment. The results from the present study and from the resiliency literature appear to strongly support this interactional model of attachment and development, where both the environmental and the individuals' attributes are considered when explaining stability and change. Further, the evidence of "relapse" provided by Sroufe et al. (1990) demonstrating that although quality of functioning may change, the trait (early attachment status) persists, provides further support for this interactional view.

Both theoretical and practical implications may be derived from the findings of the present study. First, because support was found for the stability of early attachment status and its relation to the quality of subsequent functioning, care must be taken to ensure that secure attachments are formed in parent-infant dyads. This recommendation has policy implications- for orphans, hospitalized children, children being fought over in custody battles, and children in non-maternal care, to name a few (Karen, 1994). Responsive and sensitive caregiving could be taught or encouraged in early or pre-parenting classes. Early intervention programs could be established through Mental Health or Social Services to provide support and counseling for parent-infant dyads at risk of insecure attachments. These parents could be trained in the skills that are required in order provide a "secure base" for infants so that they may form a protective secure attachment. Further, this support for stability could be used as courtroom evidence in custody trials. For example, recently there have been cases where biological parents who gave up their children as infants attempted to

reclaim them from their adoptive parents two or three years later. If one assumes a critical or sensitive period for attachment formation, then it could be argued that it is in the best interest for the child that he remain with his adoptive parents, the people to whom he has formed his primary attachments. To be taken away from the crucial and irreplaceable attachment figures would be experienced as a tragic loss for the child.

Finally, long separations, such as hospitalization or non-maternal care (i.e., day care) exceeding more than 20 hours a week should be avoided before the age of three. If a child requires hospital procedures it is advised that parents seek outpatient alternatives whenever possible, or perhaps room with their child if hospitalization is unavoidable.

While avoidance of non-maternal care is not always a practical solution for many families, a recent meta-analysis of published research on the effects of nonmaternal care on children appears to support Bowlby's theory in demonstrating that placing children during their first year of life in nonmaternal care increases the risk of insecure attachment to mother (Russell, 1994). When possible, it appears that full-time maternal care during early childhood is the ultimate goal, however this is not always possible due to socio-economic forces which require maternal employment, and family or individual characteristics. In these situations parents must find non-maternal care that is both affordable and of high quality, where the caregivers are responsive and consistent. Perhaps this compromise could be found by the alternative caregiving being provided by other family members (i.e., grandparents, aunts, etc.), or a stable and consistent figure such as a nanny. Better yet, even part-time employment is a preferred compromise.

That certain early conditions might cause insecure attachment is less of a concern because the results indicate the potential for change and discontinuity as the child grows older and has new experiences. As mentioned in the review of the literature, support for discontinuity or change indicates that more attention should be given to the roles of teachers, peers, clinicians, siblings, grandparents, support agencies such as Big Brothers and

Uncles At Large, and marital partners, as potential providers of secure attachments for children and adolescents who have insecure attachment histories. Thus, a secure environment in which one can become conscious of and explore shame and early unresolved anxieties can be provided not only by the therapeutic alliance (clinical intervention), but by a trusting friendship. As stated by Alicia Lieberman and quoted in Karen (1994, p. 403): "With a love partner one can go over and over the kinds of things that one's mother and father didn't respond to well, and if the partner responds well, it's like a release, and one can finally lay old conflicts to rest."

It must also be remembered that Main and others who have assessed adult attachment, have found that the pivotal quality of secure autonomous adults is not the experience of a secure early attachment relationship, but the distinction that they possessed the ability to reflect on their early attachments in a clear coherent manner. If they had experienced poor early relationships, but they had somehow accepted the reality of the negative aspects of their childhood and achieved a balanced view in which their later relationships and experiences allowed them to have a positive outlook of themselves. Although the roles of thought processes and relations with marital partners and others seem to be important for discontinuity, research is lacking on how they change, what the change looks like, and what makes it likely or unlikely that the change will occur. Research focusing on all aspects of discontinuity is required. Attention should be given to revealing those processes whereby change occurs. This can come in the form of qualitative studies which interview or perform path analyses of individuals who despite having early insecure attachments are now secure and well adjusted. Furthermore, the children of the poverty sample in the Minnesota longitudinal study have now reached their teenage years and provide the opportunity to trace the fate of early attachments into later years and to closely analyze the discontinuities that are found.

Finally, although the meta-analytic methodology proved useful in integrating and statistically summarizing the available broad based data, it did not provide a better understanding of many of the inconsistencies that are found in the literature. This is because many of the potential sources of inconsistency which have already been noted (i.e.-SES, gender, etc.), involve a complex interplay of individual and environmental attributes, mixed with various methodological and theoretical approaches. In order to attain a better perspective on these sources of contradictory findings, and determine how and under what circumstances they apply, a less broad-scoped, perhaps qualitative investigation is required. Perhaps if the sources of the inconsistencies can be controlled for, even more support for stability/continuity would result. This is a hypothesis which requires a greater understanding of the inconsistencies before testing can take place. It is recommended that future investigations linking attachment status and quality of functioning focus on the inconsistencies found in the current body of research and perhaps consider replicating studies which have found conflicting or contradictory evidence.

Strengths and Limitations

As systematic and objective as it may attempt to be, subjective judgments and decisions are unavoidable in meta-analyses. In the process of creating categories and coding variables, unintentional biases are created. Attempts were made to account for potential biases by providing operational definitions of categories and variables whenever possible, however this is still not sufficient to delineate all subjective choices that took place. For instance: when a study investigating the relationship of attachment status and cognitive development reports the results of five different measures (aspects) of cognitive functioning, some substantiating the association and some not, the researcher must make a decision about which result will be regarded as the effect. Sometimes the decision is straightforward, if one

measure is more valid than the other for example. In other instances the choice is not so clear and in this case often the mean total of the results is used.

A second limitation of the study is that included in the longitudinal design category are studies which are not purely longitudinal, but instead rely on some form of retrospective report of early attachment history. Despite the evidence in support of continuity and stability in attachment status and its associated effects, the reliability and validity of retrospective self-reports of early attachment history remains suspect. The difficulties in establishing longitudinal connections between the early relating of parents toward the target individual and the individual's relating to others in later life are considerable. However these difficulties only exist for certain types of research questions. There is a difference between an adult individual's actual childhood experiences and his/her construction of these experiences. If the goal of the retrospective attachment study is to connect adult individual's constructions of their early childhood attachments with the quality of their current or future functioning, then the study is straightforward. Most studies using the Adult Attachment Interview (AAI) provide an illustration of this type of research question. As mentioned previously, the AAI classification of the subject's current attachment status is not based on the actual early attachment experience that is reported, but instead upon how the subject thinks and feels about it now. Typically this AAI classification is then successfully linked to current socio-emotional functioning or to the subsequent quality of parent-child relationships. These types of retrospective studies have received support for their reliability and validity in predicting both current and prospective socio-emotional functioning (Main et al., 1985; Hazan & Shaver, 1987; Benoit, Zeanah, & Barton, 1989; Fonagy et al., 1991; Cohn et al., 1992; Zeanah, Benoit, Barton, Regan, Hirshberg, & Lipsitt, 1993; Benoit & Parker, 1994; Ward & Carlson, 1995).

Conversely, difficulties will arise if the retrospective investigation attempts to establish longitudinal connections between adult individuals' actual early childhood

attachments and current functioning status. The reason is that the potential for mediating interpersonal biases (mechanisms) exists. As a result, the quality of the study and the reliability of its claims diminishes. To illustrate, it may be the case that an individual who was denied early close attachments, but who experienced a warm secure attachment relationship in adolescence is now, as an adult, currently functioning adaptively in all domains. Based on the data from this case (a retrospective report of early attachment quality and a measure of current funtioning), one might conclude that there is no connection (direct or indirect) between early attachment and subsequent functioning without adequately considering what mediating mechanisms might be involved. An example of this type of retrospective investigation is that of Birtchnell (1993). Based on adult self reports of early maternal care Birtchnell concludes "that poor early maternal care predisposes women to later depression" (p. 341). In doing so, Birtchnell dangerously assumes that these subjects provided an unbiased report of their early relationships which had not been modified by later experience or current state of mind.

Because of the noted dangers of the retrospective method and since this type of research often centers on individuals with parenting problems, Quinton and Rutter (1984) carried out a prospective study with women who had been raised in institutions and a general population control group and found that the institutionalized women were more inclined toward poor parenting. An interesting finding however was that in a number of cases where the connection to adverse early environment did not occur, it was found that these women had a harmonious marital relationship with a nondeviant partner (Rutter & Quinton, 1984). These individuals were also more likely to have had positive school experiences and were more likely to plan their future which increased their chances of choosing a well-adapted partner. The beneficial effects of a good marriage in reducing the risk of maladjustment in individuals who had experienced adverse childhood environments is further described in the discontinuity results of studies by Brown and Harris (1978) and

Ricks (1985). It is important to point out however that evidence exists which demonstrates that those most in need of the support provided by a good marriage may not be able to benefit from it because the experienced early adversity may have impaired the ability to form secure relationships (O' Connor & Brown, 1984). Thus, in view of the evidence of both continuities and discontinuities from research in this area comes a model which claims more moderate support for continuity. In other words, early experiences will not relate strongly to later adaptive outcomes, but will relate nonetheless (Kotler & Omodei, 1988; Cohn et al., 1992).

A third limitation to this study is the scope of the analysis. There are a number of mediating variables in the present investigation including study design and quality, different aspects of functioning within the same domain, gender effects, sample characteristics (SES, normal/clinical, age, stability of environment, etc.), and differing measures of attachment and functioning, just to name a few. There needs to be a more fine-grained analysis of the data. Further analysis (multiple regression) will be necessary to qualify any mediating effects in the main effect of attachment status. This analysis will also have its limitations because many studies fail to report information on subject and environmenal characteristics, the specific aspect of domain functioning under invesigation, and gender differences, all of which may mediate the main effects.

Fourth, Different classifiction systems for assigning attachment status were employed, depending on the measure used and the research question involved. For example, some studies only reported the difference between those with secure and insecure attachments, others differentiated the insecure classifications into A, C, and/or D, while other studies (often those using the AAI) subclassified further {i.e.- A^1, A^2, B^1, B^2, B^3, U, F...}. As a result, occasionally the reported findings were of a relationship between attachment status and functioning that was strictly or more highly significant for only one/or some categories of attachment status. An illustration of this circumstance is provided by

Lewis et al. (1984) where it was reported that for males the insecure groups significantly differed from each other in the number of behavior problems they possessed. The ambivalently attached (C) males showed significantly more behavior problems than both the avoidant (A) and the securely attached (B) males. Other studies explore the attachment/functioning relation with the focus on only one type of attachment categoy (i.e., ambivalent, avoidant, disorganized, etc.). Lyons- Ruth et al. (1993) for example, examined the predictive relationship between disorganized attachment classification and hostile-aggressive behavior in the preschool classroom, and found it to be the strongest single predictor of this behavior, with 71% of hostile preschoolers classified as disorganized in their attachment relationships in infancy. Although highly significant, this finding does not say anything about the predictive power of other categories of attachment history, and is therefore difficult to synthesize with findings from studies which group all categories of insecure attachment together into a general "insecure attachment" group.

A strength of this study is that a meta-analysis methodology integrated and statistically summarized available broad and narrow based data. Further, both longitudinal and concurrent outcomes were consistent with those predicted by attachment theory for psychological functioning (i.e., behavioral effect sizes of .58 and .57, cognitive (longitudinal) effect size of .75, socio-emotional effect sizes of .76 and .69). Likewise, powerful support for stability of attachment relations as predicted by Bowlby was established (stability effect size of 1.93)

Additional support for continuity of the attachment construct across development was provided by the comparison of domain effect sizes between the longitudinal and the concurrent methods. In demonstrating that the effect sizes were only marginally different, it is evident that the concurrent relationship between attachment status and quality of functioning is no stronger than the longitudinal one. This result endorses the belief that

attachments serve as a vital and effective link to adaptive functioning at all stages of development, not just in infancy or childhood.

Summary and Conclusions

Recent scientific inquiry into the relation between attachment status and psychological functioning presents four themes: (a) contradiction - inconsistencies and conflict in the research literature, (b) change - research focus has shifted from attachment in infancy/childhood, the Strange Situation, and longitudinal studies, to attachment in adolescence and beyond, measures of internal working models, and retrospective and concurrent studies, (c) conflict - support has been provided for both continuity and discontinuities of attachment and functioning across development, (d) crisis - also known as the "critical period" question, the effects of early insecure attachment on subsequent psychological functioning.

Concerning the related themes of conflict and crisis, the results support the concept that the quality of attachment is a lasting issue for the personality. Attachment status at all stages of development was found to be concurrently linked to both socio-emotional and behavioral functioning. The internal working models of "self" and "other" that form as the result of early attachment relationships clearly govern one's psychological processes which in turn relate to the quality of social, emotional, behavioral, and cognitive functioning. These models appear to be resistant to change, thus stability of attachment status and its associated quality of functioning is supported in most cases. The quality of early attachment histories was found to be significantly related to subsequent psychological functioning in the three domains right into adulthood. The largest effect was for socio-emotional functioning, with behavioral functioning a close second. The effect for cognitive functioning, although significant, was based on only one study and therefore cannot be compared to those from the other two domains. Further, given the substantial evidence of stability of early attachments

and their predicted effects on subsequent functioning, support is provided for the belief that early insecure attachments do constitute a risk for subsequent pathological development.

However, the potential for change still exists as demonstrated by the discontinuities in psychological functioning found in the present study, and therefore the extreme view of early childhood as a "critical period" for attachment formation can be reduced to a less alarming "sensitive period" concept. Clearly, quality of attachment does not relate to all aspects of development. It does not govern intellect or ability to play for example (Karen, 1994). There are numerous influences in the complexity of the life of an individual which are not accounted for by attachment theory. It leaves out the nature of a child's inherent resiliency, temperament, luck and/or determination in finding alternative attachment figures, the choices made in adolescence or adulthood, or the adverse experiences that could be encountered beyond childhood. Nevertheless, attachment remains a useful theory and predictor of developmental outcomes, and requires more research for a better understanding of its role in the complex process of development. It is suggested that an interactionist view, which considers both individual and environmental attributes, of attachment/development be used in this area.

The meta-analysis made use of the change theme by integrating and summarizing the disparate information from studies that investigated the attachment and functioning relationship from differing perspectives, methodological viewpoints, developmental stages, and functioning domains. The most significant finding from this synthesis is that both the studies investigating the longitudinal relation between attachment and functioning and the studies which investigated the concurrent relation, resulted in equally significant effect sizes. This finding indicates that the ties between attachment status and functioning does not weaken with age as has previously been suggested.

Finally some potential sources of the contradictions and conflict found in the literature were identified. It appears that gender, socio-economic status, sample

characteristics, and methodological differences are all factors which potentially mediate the predictive relationship between attachment status and quality of functioning. This mediation results in conflicting findings, and it is hypothesized that if some of these factors could be controlled for, not only would the discord diminish, but the strength of the predictive relationship would increase.

Results of this study indicate that future research needs to focus on determining the source of the inconsistencies in the current literature, and the sources of discontinuities in attachment development. In particular, more effort must be placed on investigating the role of gender differences in the continuity and stability of attachments. Finally, there needs to be a coordinated effort between educators, families, therapists, governments, and attachment researchers in order to respond to the results and implications of attachment research.

References

Ainsworth, M. D. S., & Wittig, B. A. (1969). Attachment and exploratory behavior in one-year-olds in a strange situation. In B. M. Foss (Ed.), Determinants of infant behavior (Vol. 4, pp. 111-136). London: Methuen.

Armsden, G. C., & Greenberg, M. T. (1987). The Inventory of Parent and Peer Attachment: Individual differences and their relationship to psychological well-being in adolescence. Journal of Youth and Adolescence, 16(5), 427-454.

Armsden, G. C., McCauley, E., Greenberg, M. T., Burke, P. M., & Mitchell, J. R. (1990). Parent and peer attachment in early adolescent depression. Journal of Abnormal Child Psychology, 18(6), 683-697.

Bates, J. E., Maslin, C. A., & Frankel, K. A. (1985). Attachment security, mother-child interaction, and temperament as predictors of behavior-problem ratings at age three years. In I. Bretherton & E. Waters (Eds.), Growing points in attachment theory and research (pp. 167-193). Monographs of the Society for Research in Child Development, 50, (1-2, Serial No. 209).

Benoit, D., & Parker, K. C. H. (1994). Stability and transmissions of attachment across three generations. Child Development, 65, 1444-1456.

Benoit, D., Zeanah, C. H., & Barton, M. L. (1989). Maternal attachment disturbances and failure to thrive. Infant Mental Health Journal, 10(3), 185-202.

Birtchnell, J. (1993). Does recollection of exposure to poor maternal care in childhood affect later ability to relate? British Journal of Psychiatry, 162, 335-344.

Bosso, O. R. (1985). Attachment quality and sibling relations. Unpublished doctoral dissertation. University of Toronto.

Bowlby, J. (1951). Maternal care and mental health. Geneva, Switzerland: World Health Organization.

Bowlby, J. (1977). The making and breaking of affectional bonds, I. Aetiology and psychopathology in the light of attachment theory. British Journal of Psychiatry 130, 201-210.

Bowlby, J. (1984). Violence in the family as a disorder of the attachment and caregiving systems. American Journal of Psychoanalysis, 44, 219-311.

Brown, G. W., & Harris, T. O. (1978). The social origins of depression. London: Tavistock.

Cassidy, J. (1988). Child-mother attachment and the self in six-year-olds. Child Development, 59, 121-134.

Cassidy, J., & Marvin, R. S., & The MacArthur Working Group on Attachment. (1989). Attachment organization in three and four year olds: Coding manual. Unpublished scoring manual.

Chess, S., & Thomas, A. (1982). Infant bonding: Mystique and reality. American Journal of Orthopsychiatry, 52, 213-222.

Cicchetti, D., & Barnett, D. (1991). Attachment organization in maltreated preschoolers. Development and Psychopathology, 3, 397-411.

Clarke, A. M., & Clarke, A. D. B. (1976). Early experience: Myth and evidence. London: Open Books Publishing.

Cohn, D. A. (1990). Child-mother attachment of six-year-olds and social competence in school. Child Development, 61, 152-162.

Cohn, D. A., Cowan, P. A., Cowan, C. P., & Pearson, J. (1992). Mothers' and fathers' working models of childhood attachment relationships, parenting styles, and child behavior. Development and Psychopathology, 4, 417-431.

Cohn, D. A., Silver, D. H., Cowan, C. P., Cowan, P. A., & Pearson, J. (1992). Working models of childhood attachment and couple relationships. Journal of Family Issues, 13(4), 432-449.

Egeland, B., & Farber, E. A. (1984). Infant-mother attachment: Factors related to its development and changes over time. Child Development, 55, 753-771.

Erickson, M. F., & Farber, E. A. (1983). Infancy to preschool: Continuity of adaptation in high risk children. Paper presented at the meeting of the Society for Research in Child Development, Boston, MA.

Erickson, M. F., Sroufe, L. A., & Egeland, B. (1985). The relationship between the quality of attachment and behavior problems in preschool in a high-risk sample. In I. Bretherton & E. Waters (Eds.), Growing points in attachment theory and research (pp. 147-186). Monographs of the Society for Research in Child Development, 50, (1-2, Serial No. 209).

Fagot, B. I., & Kavanagh, K. (1990). The prediction of antisocial behavior from avoidant attachment classifications. Child Development, 61, 864-873.

Fonagy, P., Steele, H., & Steele, M. (1991). Maternal representations of attachment during pregnancy predict the organization of infant-mother attachment at one year of age. Child Development, 62, 891-905.

Frodi, A., Grolnick, W., & Bridges, L. (1985). Maternal correlates of stability and change in infant-mother attachment. Infant Mental Health Journal, 6, 60-67.

Garmezy, N. (1987). Stress, competence, and development: Continuities in the study of schizophrenic adults, children vulnerable to psychopathology, and the search for stress-resistant children. American Journal of Orthopsychiatry, 57(2), 159-174.

George, C., Kaplan, N., & Main, M. (1985). The Attachment Interview for Adults. Unpublished manuscript, University of California, Berkeley.

Glass, G., McGaw, B., & Smith, M. (1981). Meta-analysis in social research. Beverly Hills: Sage.

Gold, A., Goldberg, S., & Marcovitch, S. (1994, Sept-Oct.). Early deprivation, attachment, and behavior problems: Romanian adoptees in Ontario. Unpublished poster presentation at Attachment and Psychopathology Conference, Toronto.

Goldberg, S., Corter, C., Lojkasek, M., & Minde, K. (1990). Prediction of behavior problems in 4-year-olds born prematurely. Development and Psychopathology, 2, 15-30.

Hazan, C., & Shaver, P. (1987). Romantic love conceptualized as an attachment process. Journal of Personality and Social Psychology, 52(3), 511-524.

Hedges, L. V., Shymansky, J. A., & Woodworth, G. (1989). Modern methods of Meta-analysis. Washington: National Science Teachers Association.

Howes, C. (1988). Peer interaction of young children. Monographs of the Society for Research in Child Development, 53, (1, Serial No. 217).

Howes, C., Matheson, C. C., & Hamilton, C. E. (1994). Maternal, teacher, and child care history correlates of children's relationships with peers. Child Development, 65, 264-273.

Jacobsen, T., Edelstein, W., & Hoffmann, V. (1994). A longitudinal study of the relation between representations of attachment in childhood and cognitive functioning in childhood and adolescence. Developmental Psychology, 30(1), 112-124.

Jacobson, J. L., & Wille, D. E. (1986). The influence of attachment pattern on developmental changes in peer interaction from toddler to the preschool period. Child Development, 57, 338-347.

Kagan, J. (1984). The nature of the child. New York: Basic.

Kaplan, N., & Main, M. (1987). A system for classifying children's drawings in terms of the representations of attachment. Unpublished manuscript, University of California, Berkeley.

Karen, R. (1994). Becoming attached: Unfolding the mystery of the infant-mother bond and its impact on later life. New York: Warner Books.

Kenny, M. E., & Donaldson, G. A. (1991). Contributions of parental attachment and family structure to the social and psychological functioning of first-year college students. Journal of Counseling Psychology, 38(4), 479-486.

Kenny, M. E., & Hart, K. (1992). Relationship between parental attachment and eating disorders in an inpatient and a college sample. Journal of Counseling Psychology, 39(4), 521-526.

Kestenbaum, R., Farber, E. A., & Sroufe, L. A. (1989). Individual differences in empathy among preschoolers: Relation to attachment history. In N. Eisenberg (Ed.), Empathy and related social responses. New Directions for Child Development, 44. San Francisco: Jossey-Bass.

Kotler, T., & Omodei, M. (1988). Attachment and emotional health: A life span approach. Human Relations, 41(8), 619-640.

Kulik, J., Kulik, C., & Cohen, P. (1979). A meta-analysis of outcome studies of Keller's personalized system of instruction. American Psychologist, 34(4), 307-318.

LaFreniere, P. J., & Sroufe, L. A. (1985). Profiles of peer competence in the preschool: Interrelations between measure, influence of social ecology, and relation to attachment history. Developmental Psychology, 21(1), 56-69.

Lamb, M. (1987). Predictive implications of individual differences in attachment. Journal of Consulting and Clinical Psychology, 53(6), 817-824.

Levitt, M. J., Antonucci, T. G., & Clark, M. C. (1984). Object-person permanence and attachment: Another look. Merril-Palmer Quarterly, 30, 1-10.

Lewis, M. (1972). State as an infant-environment interaction: An analysis of mother-infant interaction as a function of sex. Merril-Palmer Quarterly, 18, 95-121.

Lewis, M. (1980). Peer interaction and maltreated children: Social network and epigenetic models. Infant Mental Health Journal, 1(4), 224-231.

Lewis, M., Feiring, C., McGuffog, C., & Jaskir, J. (1984). Predicting psychopathology in six-year-olds from early social relations. Child Development, 55, 123-136.

Lieberman, A. F. (1977). Preschoolers' competence with a peer: Relations with attachment and peer experience. Child Development, 48, 1277-1287.

Lieberman, A. F., Weston, D. R., & Pawl, J. H. (1991). Preventive intervention and outcome with anxiously attached dyads. Child Development, 62, 199-209.

Lyons-Ruth, K., Alpern, L., & Repacholi, B. (1993). Disorganized infant attachment classifications and maternal psychosocial problems as predictors of hostile-aggressive behavior in the preschool classroom. Child Development, 24(3), 415-426.

Main, M., & Cassidy, J. (1988). Categories of response to reunion with the parent at age 6: Predictable from infant attachment classifications and stable over a 1-month period. Developmental Psychology, 24(3), 415-426.

Main, M., Kaplan, N., & Cassidy, J. (1985). Security in infancy, childhood, and adulthood: A move to the level of representation. In I. Bretherton & E. Waters (Eds.), Growing points in attachment theory and research. Monographs of the Society for Research in Child Development, 50 (1-2, Serial No. 209).

Main, M., & Weston, (1981). The quality of the toddler's relationship to mother and father: Related to conflict behavior and the readiness to establish new relationships. Child Development, 52, 932-940.

Marvin, R. S. (1977). An ethological-cognitive model for the attentuation of mother-child attachment behavior. In T. Alloway, P. Pliner, & L. Krames (Eds.), Attachment behavior. (pp. 25-60). New York: Plenum.

Matas, L., Arend, R. A., & Sroufe, L. A. (1978). Continuity of adaptation in the second year: The relationship between quality of attachment and later competence. Child Development, 49, 547-556.

McCormick, C. B., & Kennedy, J. H. (1994). Parent-child attachment working models and self-esteem in adolescence. Journal of Youth and Adolescence, 23(1), 1-18.

O'Connor, P., & Brown, G. W. (1984). Supportive relationships: Fact or fancy? Journal of Social and Personal Relationships, 1, 159-175.

Oppenheim, D., Sagi, A., & Lamb, M. E. (1988). Infant-adult attachments on the kibbutz and their relation to socioemotional development 4 years later. Developmental Psychology, 24(3), 427-433.

Parker, G., Tupling, H., & Brown, L. B. (1979). A parental bonding instrument. British Journal of Medical Psychology, 52, 1-10.

Quinton, D., & Rutter, M. (1984). Parents with children in care- I. Current circumstances and parenting. Journal of Child Psychology and Psychiatry, 25, 211-229.

Renken, B., Egeland, B., Marvinney, D., Manglesdorf, S., & Sroufe, L. A. (1989). Early childhood antecedents of aggression and passive-withdrawal in early elementary school. Journal of Personality, 57(2), 257-281.

Ricks, M. H. (1985). The social transmission of parental behavior: Attachment across generations. In I. Bretherton & E. Waters (Eds.), Growing points of attachment theory and research. Monographs of the Society for Research in Child Development, (Vol. 50, Nos. 1-2).

Russell, C. M. (1994). Effects of nonmaternal care on children: A meta-analysis of published studies. Unpublished masters thesis, University of Calgary.

Rutter, M. (1981). Stress, coping, and development: Some issues and some questions. Journal of Child Psychology and Psychiatry, 22, 323-356.

Rutter, M. (1982). Epidemiological-longitudinal approaches to the study of development. In W. A. Collins (Ed.), The concept of development, Minnesota symposia on child psychology, (Vol. 15). Hillsdale, N. J. : Lawrence Erlbaum.

Rutter, M. (1985). Resilience in the face of adversity. British Journal of Psychiatry, 147, 598-611.

Rutter, M. (1987). Psychosocial resilience and protective mechanisms. American Journal of Orthopsychiatry, 57(3), 316-331.

Rutter, M., & Quinton, D. (1984). Long-term follow-up of women institutionalized in childhood: Factors promoting good functioning in adult life. British Journal of Developmental Psychology, 2, 191-204.

Rutter, M., & Rutter, M. (1992). Developing minds: Challenge and continuity across the life span. London: Penguin Books.

Sameroff, A. J., & Chandler, M. J. (1975). Reproductive risk and the continuum of caretaking casualty. In F. D. Horowitz (Ed.), Review of Child Development Research (Vol. 4). Chicago: University of Chicago Press.

Schneider-Rosen, K., Braunwald, K. G., Carlson, V., & Cicchetti, D. (1985). Current perspectives in attachment theory: Illustration from the study of maltreated infants. In I. Bretherton & E. Waters (Eds.), Growing points in attachment theory and research (pp. 194-210). Monographs of the Society for Research in Child Development, 50, (1-2, Serial No. 209).

Sroufe, L. A. (1983). Individual patterns of adaptation from infancy to preschool. In M. Perlmutter (Ed.), Minnesota symposium on child psychology, (Vol.16, pp. 41-83). Hillsdale, N. J. : Erlbaum.

Sroufe, L. A., Bennett, C., Englund, M., Urban, J., & Shulman, S. (1993). The significance of gender boundaries in preadolescence: Contemporary correlates and antecedents of boundary violation and maintenance. Child Development, 64, 455-466.

Sroufe, L. A., Egeland, B., & Kreutzer, T. (1990). The fate of early experience following developmental change: Longitudinal approaches to individual adaptation in childhood. Child Development, 61, 1363-1373.

Sroufe, L. A., Fox, N. E., & Pancake, V. R. (1983). Attachment and dependency in developmental perspective. Child Development, 54, 1615-1627.

Suess, G. J., Grossmann, K. E., & Sroufe, L. A. (1992). Effects of infant attachment to mother and father on quality of adaptation in preschool: From dyadic to individual organisation of self. Internation Journal of Behavioral Development, 15(1), 43-65.

Suomi, S. J., & Harlow, H. F. (1972). Social rehabilitation of isolate-reared monkeys. Developmental Psychology, 6, 487-496.

Thompson, R. A., Lamb, M. E., & Estes, D. (1982). Attachment and its relationship to changing life circumstances in an unselected middle-class sample. Child Development, 53, 144-148

Troy, M., & Sroufe, L. A. (1987). Victimization among preschoolers: Role of attachment relationship history. Journal of the American Academy of Child and Adolescent Psychiatry, 26(2), 166-172.

Turner, P. J. (1991). Relations between attachment, gender, and behavior with peers in preschool. Child Development, 62, 1475-1488.

Urban, J., Carlson, E., Egeland, B., & Sroufe, L. A. (1991). Patterns of individual adaptation across childhood. Development and Psychopathology, 3, 445-460.

Vaughn, B., Egeland, B., Sroufe, L. A., & Waters, E. (1979). Individual differences in infant-mother attachment at twelve and eighteen months: Stability and change in families under stress. Child Development, 50, 971-975.

Ward, M. J., & Carlson, E. A. (1995). Associations among adult attachment representations, maternal sensitivity, and infant-mother attachment in a sample of adolescent mothers. Child Development, 66, 69-79.

Wartner, U. G., Grossmann, K., Fremmer-Bombick, E., & Suess, G. (1994). Attachment patterns at age six in south Germany: Predictability from infancy and implications for preschool behavior. Child Development, 65, 1014-1027.

Waters, E. (1978). the reliability and stability of individual differences in infant-mother attachment. Child Development, 49, 483-494.

Waters, E. (1987, April). Validation of Strange Situation classifications via Q-sort data on secure base behavior at home. Paper presented at the biennial meeting of the Society for Research in Child Development, Baltimore.

Waters, E., & Deane, K. E. (1985). Defining and assessing individual differences in attachment relationships: Q-methodology and the organization of behavior in infancy and early childhood. In I. Bretherton & E. Waters (Eds.), Growing points in attachment theory and research. Monographs of the Society for Research in Child Development, 50(1-2, Serial No. 209).

Waters, E., Wippman, J., & Sroufe, L. A. (1979). Attachment, positive affect, and competence in the peer group: Two studies in construct validation. Child Development, 50, 821-829.

West, M., Rose, M. S., & Sheldon, A. (1993). Anxious attachment as a determinant of adult psychopathology. The Journal of Nervous and Mental Disease, 181, 422-427.

Werner, E. E., & Smith, R. S. (1982). Vulnerable but invincible: A longitudinal study of resilient children and youth. New York: McGraw Hill.

Wolf, F. M. (1986). Meta-analysis quantitative methods for research synthesis. London: Sage Publications.

Zeanah, C. H., Benoit, D., Barton, M., Regan, C., Hirshberg, L. M., & Lipsitt, L. P. (1993). Representations of attachment in mothers and their one-year-old infants. Journal of the American Academy of Child and Adolescent Psychiatry, 32(2), 278-286.

Appendices

Appendix A. Studies Utilized in the Meta-Analysis

1. Armsden, G. C., & Greenberg, M. T. (1987). The Inventory of Parent and Peer Attachment: Individual differences and their relationship to psychological well-being in adolescence. Journal of Youth and Adolescence, 16(5), 427-454.

2. Armsden, G. C., McCauley, E., Greenberg, M. T., Burke, P. M., & Mitchell, J. R. (1990). Parent and peer attachment in early adolescent depression. Journal of Abnormal Child Psychology, 18(6), 683-697.

3. Bates, J. E., Maslin, C. A., & Frankel, K. A. (1985). Attachment security, mother-child interaction, and temperament as predictors of behavior-problem ratings at age three years. In I. Bretherton & E. Waters (Eds.), Growing points in attachment theory and research (pp.167-193). Monographs of the Society for Research in Child Development, 50, (1-2, Serial No. 209).

4. Belsky, J., Garduque, L., & Hrncir, E. (1984). Assessing performance, competence, and executive capacity in infant play: Relations to home ennvironment and security of attachment. Developmental Psychology, 20(3), 406-417.

5. Benoit, D., & Parker, K. C. H. (1994). Stability and transmissions of attachment across three generations. Child Development, 65, 1444-1456.

6. Benoit, D., Zeanah, C. H., & Barton, M. L. (1989). Maternal attachment disturbances and failure to thrive. Infant Mental Health Journal, 10(3), 185-202.

7. Birtchnell, J. (1993). Does recollection of exposure to poor maternal care in childhood affect later ability to relate? British Journal of Psychiatry, 162, 335-344.

8. Bus, A. G., & Van IJzendoorn, M. H. (1988). Mother-child interactions, attachment, and emergent literacy: A cross-sectional study. Child Development, 59, 1262-1272.

9. Cassidy, J. (1988). Child-mother attachment and the self in six-year-olds. Child Development, 59, 121-134.

10. Cicchetti, D., & Barnett, D. (1991). Attachment organization in maltreated preschoolers. Development and Psychopathology, 3, 397-411.

11. Clarke-Stewart, K. A., & Hevey, C. M. (1982). Longitudinal relations in repeated observations of mother-child interaction from 1 to 2½ years. Developmental Psychology, 17(2), 127-145.

12. Cohn, D. A. (1990). Child-mother attachment of six-year-olds and social competence in school. Child Development, 61, 152-162.

13. Cohn, D. A., Cowan, P. A., Cowan, C. P., & Pearson, J. (1992). Mothers' and fathers' working models of childhood attachment relationships, parenting styles, and child behavior. Development and Psychopathology, 4, 417-431.

14. Cohn, D. A., Silver, D. H., Cowan, C. P., Cowan, P. A., & Pearson, J. (1992). Working models of childhood attachment and couple relationships. Journal of Family Issues, 13(4), 432-449.

15. Crowell, J. A. & Feldman, S. S. (1988). Mothers' internal models of relationships and children's behavioral and developmental status: A study of mother-child interaction. Child Development, 59, 1273-1285.

16. Egeland, B., & Farber, E. A. (1984). Infant-mother attachment: Factors related to its development and changes over time. Child Development, 55, 753-771.

17. Erickson, M. F., Sroufe, L. A., & Egeland, B. (1985). The relationship between quality of attachment and behavior problems in preschool in a high-risk sample. In I. Bretherton & E. Waters (Eds.), Growing points in attachment theory and research (pp. 147-186).Monographs of the Society for Research in Child Development, 50, (1-2, Serial No. 209).

18. Fagot, B. I. & Kavanagh, K. (1990). The prediction of antisocial behavior from avoidant attachment classifications. Child Development, 61, 864-873.

19. Fonagy, P., Steele, H., & Steele, M. (1991). Maternal representations of attachment during pregnancy predict the organization of infant-mother attachment at one year of age. Child Development, 62, 891-905.

20. Frodi, A., Grolnick, W., & Bridges, L. (1985). Maternal correlates of stability and change in infant-mother attachment. Infant Mental Health Journal, 6, 60-67.

21. Gold, A., Goldberg, S., & Marcovitch, S. (1994, Sept-Oct). Early deprivation, attachment and behavior problems: Romanian adoptees in Ontario. Unpublished poster presentation at Attachment and Psychopathology Conference, Toronto.

22. Goldberg, S., Corter, C., Lojkasek, M., & Minde, K. (1990). Prediction of behavior problems in 4-year-olds born prematurely. Development and Psychopathology, 2, 15-30.

23. Goldberg, S., Lojkasek, M., Gartner, G., & Corter, C. (1989). Maternal responsiveness and social development in preterm infants. In M. H. Bornstein (Ed.), Maternal respsonsiveness: characteristics and consequences. New Directions for Child Development, 43. San Fancisco: Jossey-Bass.

24. Goldberg, S., Washington, J., Morris, P., Fischer-Fay, A., & Simmons, R. J. (1990). Early diagnosed chronic illness and mother-child relationships in the first two years. Canadian Journal of Psychiatry, 35, 726-429.

25. Greenberg, M. T., Speltz, M. L., Deklyen, M., & Endriga, M. C. (1991). Attachment security in preschoolers with and without externalizing behavior problems: A replication. Development and Psychopathology, 3, 413-430.

26. Grossi, V., & Violato, C. (1992). Attempted suicide among adolescents: A stepwise discriminant analysis. Canadian Journal of Behavioral Science, 24(3), 410-413.

27. Groze, V. (1992). Adoption, attachment and self-concept. Child and Adolescent Social Work Journal, 9(2), 169-191.

28. Hazan, C., & Shaver, P. (1987). Romantic love conceptualized as an attachment process. Journal of Personality and Social Psychology, 52(3), 511-524.

29. Howes, C., Matheson, C. C., & Hamilton, C. E. (1994). Maternal, teacher, and child care history correlates of children's relationships with peers. Child Development, 65, 264-273.

30. Jacobsen, T., Edelstein, W., & Hoffman, V. (1994). A longitudinal study of the relation between representations of attachment in childhood and cognitive functioning in childhood and adolescence. Developmental Psychology, 30(1), 112-124.

31. Jacobson, J. L., & Wille, D. E. (1986). The influence of attachment pattern on developmental changes in peer interaction from the toddler to the preschool period. Child Development, 57, 338-347.

32. Kenny, M. E., & Donaldson, G. A. (1991). Contributions of parental attachment and family structure to the social and psychological functioning of first-year college students. Journal of Counseling Psychology, 38(4), 479-486.

33. Kenny, M. E., & Hart, K. (1992). Relationship between parental attachment and eating disorders in an inpatient and a college sample. Journal of Counseling Psychology, 39(4), 521-526.

34. Kestenbaum, R., Farber, E. A., & Sroufe, L. A. (1989). Individual differences in empathy among preschoolers: Relation to attachment history. In N. Eisenberg (Ed.), Empathy and related emotional responses. New Directions for Child Development, 44. San Francisco: Jossey-Bass.

35. Kirkpatrick, L. A., & Davis, K. E. (1994). Attachment style, gender, and relationship stability: A longitudinal analysis. Journal of Personality and Social Psychology, 66(3), 502-512.

36. Kobak, R. R., & Sceery, A. (1988). Attachment in late adolescence: Working models, affect regulation, and representations of self and others. Child Development, 59, 135-146.

37. Kotler, T., & Omodei, M. (1988). Attachment and emotional health: A life span approach. Human Relations, 41(8), 619-640.

38. LaFreniere, P. J., & Sroufe, L. A. (1985). Profiles of peer competence in the preschool: Interrelations between measure, influence of social ecology, and relation to attachment history. Developmental Psychology, 21(1), 56-69.

39. Lapsley, D. K., Rice, K. G., & FitzGerald, D. P. (1990). Adolescent attachment, identity, and adjustment to college: Implications for the continuity of adaptation hypothesis. Journal of Counseling & Development, 68, 561-565.

40. Lewis, M., Feiring, C., McGuffog, C., & Jaskir, J. (1984). Predicting psychopathology in six-year-olds from early social relations. Child Development, 55. 123-136.

41. Lieberman, A. F. (1977). Preschoolers' competence with a peer: Relations with attachment and peer experience. Child Development, 48, 1277-1287.

42. Londerville, S., & Main, M. (1981). Security of attachment, compliance, and maternal training methods in the second year of life. Developmental Psychology, 17(3), 289-299.

43. Lutkenhaus, P., Grossman, K. E., & Grossman, K. (1985). Infant-mother attachment at twelve months and style of interaction with a stranger at the age of three years. Child Development, 56, 1538-1542.

44. Lyons-Ruth, K., Alpern, L., & Repacholi, B. (1993). Disorganized infant attachment classifications and maternal psychosocial problems as predictors of hostile-aggressive behavior in the preschool classroom. Child Development, 64, 572-585.

45. Main, M., & Cassidy, J. (1988). Categories of response to reunion with the parent at age 6: Predictable from infant attachment classifications and stable over a 1-month period. Developmental Psychology, 24(3), 415-426.

46. Main, M., Kaplan, N., & Cassidy, J. (1985). Security in infancy, childhood, and adulthood: A move to the level of representation. In I. Bretherton & E. Waters (Eds.), Growing points in attachment theory and research. Monographs of the Society for Research in Child Development, 50 (1-2, Serial No. 209).

47. Main, M., & Weston, D. R. (1981). The quality of the toddler's relationship to mother and to father: Related to conflict behavior and the readiness to establish new relationships. Child Development, 52, 932-940.

48. Marcus, R. F. (1991). The attachments of children in foster care. Genetic, Social, and General Psychology Monographs, 117(4), 367-394.

49. Matas, L., Arend, R. A., & Sroufe, L. A. (1978). Continuity of adaptation in the second year: The relationship between quality of attachment and later competence. Child Development, 49, 547-556.

50. McCormick, C. B., & Kennedy, J. H. (1994). Parent-child attachment working models and self-esteem in adolescence. Journal of Youth and Adolescence, 23(1), 1-18.

51. Mrazek, D. A., Casey, B., & Anderson, I. (1987). Insecure attachment in severley asthmatic preschool children: Is it a risk factor? Journal of the American Academy of Child and Adolescent Psychiatry, 26(4), 516-520.

52. Oppenheim, D., Sagi, A., & Lamb, M. E. (1988). Infant-adult attachments on the kibbutz and their relation to socioemotional development 4 years later. Developmental Psychology, 24(3), 427-433.

53. Park, K. A., & Waters, E. (1989). Security of attachment and preschool friendships. Child Development, 60, 1076-1081.

54. Pettit, G. S., Dodge, K. A., & Brown, M. M. (1988). Early family experience, social problem solving patterns, and children's social competence. Child Development, 59, 107-120.

55. Pierrehumbert, B., Iannotti, R. J., Cummings, E. M., & Zahn-Waxler, C. (1989). Social functioning with mother and peers at 2 and 5 years: The influence of attachment. International Journal of Behavioral Development, 12(1), 85-100.

56. Pastor, D. L. (1981). The quality of mother-infant attachment and its relationship to toddler's initial sociability with peers. Developmental Psychology, 17(3), 326-335.

57. Quintana, S. M., & Lapsley, D. K. (1987). Adolescent attachment and ego identity: A structural equations approach to the continuity of adaptation. Journal of Adolescent Research, 2(4), 393-409.

58. Raja, S. N., McGee, R., & Stanton, R. S. (1992). Perceived attachments to parents and peers and psychological well-being in adolescence. Journal of Youth and Adolescence, 21(4), 471-485.

59. Renken, B., Egeland, B., Marvinney, D., Manglesdorf, S., & Sroufe, L. A. (1989). Early childhood antecedents of aggression and passive-withdrawal in early elementary school. Journal of Personality, 57(2), 257-281.

60. Richman, J. A., & Flaherty, J. A. (1987). Adult Psychosocial assets and depressive mood over time: Effects of internalized childhood attachments. Journal of Nervous and Mental Disease, 175(12), 703-712.

61. Schneider-Rosen, K., Braunwald, K. G. , Carlson, V., & Cicchetti, D. (1985). Current perspectives in attachment theory: Illustration from the study of maltreated infants. In I. Bretherton & E. Waters (Eds.), Growing points in attachment theory and research (pp. 194-210).Monographs of the Society for Research in Child Development, 50, (1-2, Serial No. 209).

62. Sperling, M. B., Sharp, J. L., & Fishler, P. H. (1991). On the nature of attachment in a borderline population: A preliminary investigation. Psychological Reports, 68, 543-546.

63. Sroufe, L. A., Bennett, C., Englund, M., Urban, J., & Shulman, S. (1993). The significance of gender boundaries in preadolescence: Contemporary correlates and antecedents of boundary violation and maintenance. Child Development, 64, 455-466.

64. Sroufe, L. A., Fox, N. E., & Pancake, V. R. (1983). Attachment and dependency in developmental perspective. Child Development, 54, 1615-1627.

65. Stevenson-Hinde, J., & Shouldice, A. (1990). Fear and attachment in 2.5-year-olds. British Journal of Developmental Psychology, 8, 319-333.

66. Strang, S. P., & Orlofsky, J. L. (1990). Factors underlying suicidal ideation among college students: A test of Teicher and Jacobs' model. Journal of Adolescence, 13, 39-52.

67. Suess, G. J., Grossman, K. E., & Sroufe, L. A. (1992). Effects of infant attachment to mother and father on quality of adaptation in preschool: From dyadic to individual organisation of self. International Journal of Behavioral Development, 15(1), 43-65.

68. Thompson, R. A., Lamb, M. E., & Estes, D. (1982). Attachment and its relationship to changing life circumstances in an unselected middle-class sample. Child Development, 53, 144-148.

69. Troy, M., & Sroufe, L. A. (1987). Victimization among preschoolers: Role of attachment relationship history. Journal of the American Academy of Child and Adolescent Psychiatry, 26(2), 166-172.

70. Turner, P. J. (1991). Relations between attachment, gender, and behavior with peers in preschool. Child Development, 62, 1475-1488.

71. Urban, J., Carlson, E., Egeland, B., & Sroufe, L. A. (1991). Patterns of individual adaptation across childhood. Development and Psychopathology, 3, 445-460.

72. Vaughn, B., Egeland, B., Sroufe, L. A., & Waters, E. (1979). Individual differences in infant-mother attachment at twelve and eighteen months: Stability and change in families under stress. Child Development, 50, 971-975.

73. Ward, M. J., & Carlson, E. A. (1995). Associations among adult attachment representations, maternal sensitivity, and infant-mother attachment in a sample of adolescent mothers. Child Development, 66, 69-79.

74. Wartner, U. G., Grossmann, K., Fremmer-Bombick, E., & Suess, G. (1994). Attachment patterns at age six in south Germany: Predictability from infancy and implications for preschool behavior. Child Development, 65, 1014-1027.

75. Waters, E. (1978). The reliability and stability of individual differences in infant-mother attachment. Child Development, 49, 483-494.

76. Waters, E., Wippman, J., & Sroufe, L. A. (1979). Attachment, positive affect, and competence in the peer group: Two studies in construct validation. Child Development, 50, 821-829.

77. West, M., Rose, M. S., & Sheldon, A. (1993). Anxious attachment as a determinant of adult psychopathology. The Journal of Nervous and Mental Disease, 181, 422-427.

78. Zeanah, C. H., Benoit, D., Barton, M., Regan, C., Hirshberg, L. M., & Lipsitt, L. P. (1993). Representations of attachment in mothers and their one-year-old infants. Journal of the American Academy of Child and Adolescent Psychiatry, 32(2), 278-286.

Appendix B. Coding Scheme

Variable	Column	Data Representation
Number of study	1-2	1 to 92
Year of study	3-4	0 to 95
Number of subjects	5-7	1 or more
Statistic used	8	1- t-test 2- F 3- *r* 4- kappa 5- χ^2 6- %
Valence of adaptation	9	1-maladaptive functioning 2- neutral functioning 3-adaptive functioning
Control group	10	1- control group 2- no control group
Control group size	11-13	0 or more
Age of subjects at completion of longitudinal study	14-16	16 months or more
Statistic used to determine gender effect	17	(see statistic used)
Gender effect	18-20	0.00 or more
Effect size for longitudinal studies in the following domains:		
Behavioral (male)	21-23	0.00 or more
Behavioral (female)	24-26	" " "
Behavioral (total)	27-29	" " "
Cognitive	30-31	" " "
Soc-Emotional (male)	32-34	" " "

Soc-Emotional (female)	35-37	" " "
Soc-Emotional (total)	38-40	" " "
Soc-Emotional (control)	41-43	" " "
Stability	44-46	" " "
Stability (control)	47-49	" " "
Age of subjects in concurrent study:		
males	50-52	12 months or more
females	53-55	" " "
total	56-58	" " "
Effect size in concurrent studies in the following domains:		
Behavioral (experimental)	59-61	0.00 or more
Behavioral (control)	62-64	" " "
Behavioral (total)	65-67	" " "
Soc-Emotional (male)	68-70	" " "
Soc-Emotional (female)	71-73	" " "
Soc-Emotional (total)	74-76	" " "