The Exploration of Mechanisms Linking Adolescent Attachment Organization and Friendship Competence

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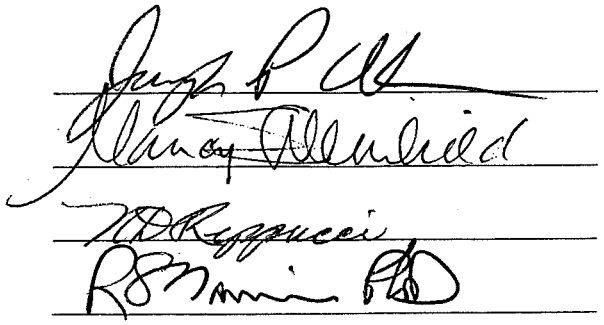

Abstract

Data from a final sample of 147, racially/ethnically and socio-economically diverse, target teens (77 female), and their closest, same-gendered friend, were collected over three annual waves of data collection. The current project included two studies designed to address specific gaps in the literature on links between parenting and peer outcomes for adolescents. Possible cognitive-emotional mechanisms that may mediate links between qualities of parent-adolescent relationships (as measured by interview-assessed attachment organization) and friendship competencies during adolescence were examined. Attachment-related affective arousal and social-cognitive flexibility (i.e., cognitive primacy) were not related with one another in predicting attachment organization, de/hyperactivation, or states of mind. There was some evidence that attachment-related affective arousal is associated with deactivation of the attachment system in predictable ways (for boys), that affective arousal interacts with attachment states of mind when predicting friend-reported friendship competence (more dramatically for boys than girls), and that primacy was associated with hyperactivation of the attachment system. While not overwhelming, these results suggest that affective arousal, or perhaps the interpersonal expression of attachment-related affective arousal, may somewhat differentially impact boys' and girls' friendships, and that insecure teens may fail to use all available information when judging new people. These studies provide modest, albeit theoretically viable, evidence for affect management and social-cognitive flexibility mechanisms of attachment organization. Future research should address measurement and sample limitations of this project.

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The Exploration of Mechanisms Linking Adolescent Attachment Organization and Friendship Competence

An abundance of research has demonstrated that parenting influences friendship development during childhood and adolescence (as reviewed by Ladd, 1992; Sroufe, Egeland, & Carlson, 1999). Friendships become increasingly important during adolescence as teens begin to rely on peers rather than parents for emotional support (e.g., Buhrmester, 1996; Engels, Finkenauer, Meeus, & Dekovic, 2001; Furman, 1999). Adolescents who are ultimately successful at maintaining close, intimate friendships are more interpersonally competent and emotionally well adjusted than teens with less intimate friendships (e.g., Berndt, 1996; Buhrmester, 1990; Newcomb & Bagwell, 1996; Reisman, 1985). Nonetheless, surprisingly little has been discovered regarding the adolescent-specific, cognitive-emotional mechanisms responsible for the links between parenting and different friendship competence during adolescence. Identifying and describing such mechanisms can substantially enhance our understanding of adolescent development and inform developmentally-based psychosocial interventions. The primary goal of this study, therefore, is to examine possible cognitive-emotional mechanisms that may mediate links between qualities of parent-adolescent relationships and friendship competence during adolescence.

Qualities of Parent-Adolescent Relationships and Attachment Organization

Bowlby's (1982) attachment theory provides a framework from which the historical and current quality of parent-child/adolescent relationships may be understood (e.g., Allen et al., 2003). Infant attachment behaviors, as observed by Ainsworth in the

landmark Strange Situation paradigm (Ainsworth, Blehar, Waters, & Wall, 1978), were predicted largely from maternal sensitivity during the first few months of life (reviewed in Peck, 2003; Weinfield, Sroufe, Egeland, & Carlson, 1999). Infants exhibiting secure attachment behaviors, including distress when their mothers left and being easily comforted upon her return, experienced mothers who were consistently warm, available, and protective. Avoidant infants largely ignored their mothers and focused on toys during the laboratory task. They had often experienced mothers who were insensitive to their distress signals and appeared to dislike physical contact. Resistant infants, who were typically inconsolable during the task, often experienced mothers who were inconsistently responsive to their needs. Disorganized/Disoriented infants are classified as such, regardless of any other possible classification, if they exhibit disorganized (e.g., approaching parent with head averted) or disoriented (e.g., still/freezing for many seconds, rocking) behaviors. These infants most often experienced mothers who were frightening and/or abusive.[1] Studies also have linked parents who are child-centered, warm, accepting, and not controlling to having infants who exhibit secure attachment behaviors into early childhood (Barnett, Kidwell, & Leung, 1998; Benn, 1986; Booth, Rose-Krasnor, & Rubin, 1991; Cassidy, Kirsh, Scolton, & Parke, 1996; Main, 1996). Additionally, interventions aimed at improving maternal sensitivity are associated with increasing parenting behaviors that promote secure attachment (e.g., Marvin, Cooper, Hoffman, & Powell, 2002), and significantly enhanced attachment security in children (reviewed by Bakermans-Kranenburg, van Ijzendoorn, & Juffer, 2003).

[1] A small group of children cannot be classified using the groups described here (Ainsworth et al., 1978).

Bowlby (1982) conceptualized *internal working models of attachment* as child-centered, largely unconscious, cognitive-emotional mechanisms arising from early experiences with attachment figures and evolving over the lifespan. The rise of formal operational thought during adolescence increases capacities for critically reflecting on self and others and fosters abstract thinking (Inhelder & Piaget, 1958; Kobak & Cole, 1994; Piaget, 1972), which together allow multiple past and current experiences to be organized and transformed into a cohesive and general approach to coping with attachment information (Waters & Deane, 1985). Thus, as a child matures into adolescence and adulthood, internal working models are believed to be augmented by ongoing qualities of parental relationships, which are integrated into an internal, cognitive-emotional attachment organization (Allen & Land, 1999; Allen, Marsh et al., 2002; Crittenden, 1994; Weinfield et al., 1999). In adolescence and adulthood, attachment organization is classified as autonomous/secure, dismissing, preoccupied, and unresolved/disorganized (a super-ordinate category). These classifications are believed to be roughly parallel to the infant categories of secure, avoidant, resistant, and disorganized/disoriented, respectively (see Appendix A).

Proposed Mechanisms by Which Attachment Organization May Function

This study conceptualizes an affective and a cognitive mechanism by which attachment organization may function based on underlying assumptions of Bowlby's internal working-model hypothesis as well as of interview-assessed attachment organization: (1) an affect management, emotionally-based mechanism, and (2) a social-cognitive flexibility, cognitive schema-driven mechanism.

Affect Management Mechanism. Attachment theory is based, in part, on individuals learning to manage their negative affect by experiencing consistent parental availability, sensitivity, and responsiveness (Bowlby, 1982; Bugental, Lin, & Susskind, 1995; Sroufe, 1996), and that effectively communicated negative affect may be soothed by seeking comfort from others (Cassidy, 1994; Grossmann, Grossmann, & Zimmerman, 1999; Kobak & Sceery, 1988; Mikulincer, Shaver, & Pereg, 2003). Individuals who inadequately manage their affective arousal likely develop maladaptive responses to their environment (Bugental et al., 1995; Lemerise & Arsenio, 2000). Inability to manage affect has been associated both with poor interpersonal competence (Bartle-Haring & Sabatelli, 1997; Greenberg, Kusche, & Speltz, 1991), as well as with internalizing and externalizing problems (Caspi, 1998; Cole, Zahn-Waxler, & Smith, 1994; Kagan, 1998; Rothbart & Bates, 1994).

Research taking attachment status into account finds similar results (also see Mikulincer et al., 2003; Peck, 2003, for a review of emotion regulation and attachment). Secure attachment in infancy is associated with appropriate behavior regulation (Erickson, Sroufe, & Egeland, 1985; Weinfield, Ogawa, & Sroufe, 1997; Zimmerman, Gliwitzky, & Becker-Stoll, 1996) and relationship-promoting behavior when problem solving with peers (Lutkenhaus, Grossmann, & Grossmann, 1985; Moss, Gosselin, Parent, Rousseau, & Dumont, 1997). Secure children are also less likely than insecure children to show fear and anger in laboratory paradigms designed to elicit fear and anger, and insecure children become more fearful, less joyful, and more angry over time (Kochanska, 2001). Insecure children ask for more help when problem solving with their

mothers (Colman & Thompson, 2002), are less tolerant of frustration, and inappropriately label and share affective information (Greenberg et al., 1991). Secure teens demonstrate less dysfunctional anger and avoidance when problem-solving with their mothers (Kobak, Cole, Ferenz-Gillies, Fleming, & Gamble, 1993). When comparing secure and insecure adolescents who rated themselves as feeling confused and helpless during a complex problem-solving task with their friends, more disruptive behavior was demonstrated by the insecure adolescents (Zimmerman, Maier, Winter, & Grossmann, 2001). Insecure adolescents also report poor behavioral and emotional regulation when dealing with rejection from others (Zimmerman, 1999).

Insecure adolescents and adults also demonstrate socially-maladaptive ways of managing affect associated with recounting attachment relationships when given a semi-structured interview designed to activate the attachment system (Adult Attachment Interview, AAI, Main & Goldwyn, 1991). Dismissing individuals suppress attachment-related arousal by largely ignoring or derogating negative relationship information. They minimize the importance of negative aspects of relationships with caregivers by idealizing, glossing-over, minimizing, devaluing, and/or failing to recall painful memories. On the other hand, preoccupied individuals become entangled with attachment information. They give heightened and disproportionate attention to attachment needs and experiences by providing incoherent, rambling, vague, and inconsistent discourse distracting away from painful memories (evidence of anxiety surrounding attachment relationships), or an intense and angry focus on painful memories (Main & Goldwyn, 1991).

Some researchers have examined biological and physiological markers of arousal in order to understand how attachment may reflect internal arousal states. Schieche and Spangler (1994) published preliminary findings that secure 1-year-olds have lower overall levels of adrenocortical activity (as evidenced by salivary cortisol levels) 15 minutes after the Strange Situation than both avoidant and resistant infants.[2] Dozier and Kobak (1992) found galvanic skin conductance increased substantially for college students who devalued attachment (dismissing students) as well as those who gave excessive negative detail (preoccupied students) when given the AAI.

This biology-behavior discordance may be due to insecure individuals' cognitive-emotional attempts to behaviorally manage their negative affect, and demonstrates that the actual autonomic arousal may be similar for dismissing and preoccupied individuals. Preoccupied individuals, who likely experienced inconsistent parenting, may continually and haphazardly send distress signals trying to elicit care in hopes that one of their attempts might "work." Thus, they may underregulate their attachment needs and hyperactivate their attachment system and affective arousal. Since dismissing individuals likely experienced parents who were unavailable and unresponsive, they may eventually have stopped sending out distress signals to elicit care. These individuals may defensively exclude their attachment needs by inhibiting or hyperregulating their attachment needs and deactivating their attachment system and affective arousal (Crittenden, 1995; Dozier & Kobak, 1992; Kobak & Cole, 1994). In sharp contrast to preoccupied individuals who may overtly demonstrate substantial, entangled distress

[2] Only resistant children exhibited an increase in adrenocortical activity after the Strange Situation.

about attachment relationships, dismissing individuals may appear nonchalant or even satisfied with attachment relationships, and may even fail to perceive or report attachment related negative affect (Bowlby, 1980; Cassidy & Kobak, 1988; Dozier & Kobak, 1992).

Social-Cognitive Flexibility Mechanism. Also essential to attachment theory is the degree to which individuals are willing to explore their environments, including their interpersonal "environments" (Bowlby, 1982). Secure individuals, who trust that someone will respond if they need help, are thought to be cognitively free to explore and evaluate their surroundings and their internal states (Waters & Deane, 1985). Thus, social-cognitive development may be enhanced as secure individuals are open to new information, better able to meta-monitor their own actions and thoughts, and more likely to accurately process and flexibly integrate their experiences in social relationships (Allen, Marsh et al., 2002; Crittenden, 1995; Kobak & Cole, 1994; Main & Goldwyn, 1991). In contrast, insecure individuals are presumed to be somewhat cognitively inflexible and hypervigilant to interpersonal threat (Main, 1996; Marvin & Britner, 1999). They, therefore, have less cognitive working space in which to assess potential threat (Kobak & Cole, 1994), and are likely to narrowly and rapidly evaluate interpersonal information (Mikulincer, 1997) – thus, demonstrating a "primacy effect" (Asch, 1946) by attending to only the first bit of information presented while largely ignoring subsequent information. Insecure individuals are also presumed to be less capable of meta-monitoring, and more likely to fail to perceive their own impact on their surroundings and interactions (Kobak & Cole, 1994; Main, 1991). Insecure individuals, therefore, may

be at increased risk for restricted social-cognitive processing where they misperceive, or defensively exclude, key social information (Allen, Marsh et al., 2002; Bowlby, 1980; Main, 1991; Zeijlmans van Emmichoven, van Ijzendoorn, de Ruiter, & Brosschot, 2003). Repeatedly, such disordered social information processing has been demonstrated to be associated with poor social skills and interpersonal competence (e.g., Cassidy et al., 1996; Dodge, 1993; Dodge & Schwartz, 1997; Lochman & Dodge, 1994, 1998).

The extant investigations of attachment and cognitive processing support these hypotheses. Young children judged to be secure exhibit more rapid cognitive development, increased cognitive flexibility and perspective taking, and greater social-emotional understanding (Jacobsen, Edelstein, & Hofmann, 1994; Meins, 1997), and to demonstrate object permanence earlier than insecure children (Ahmed & Worobey, 1984; Bell, 1970). In a longitudinal study, Icelandic adolescents who were identified as secure in childhood scored higher on Piagetian deductive and syllogistic reasoning tasks than insecure adolescents, and insecure-disorganized adolescents scored the lowest (Jacobsen et al., 1994). Secure children also have more positive assumptions about peer intent in ambiguous situations (Cassidy et al., 1996). College students with self-identified secure attachment styles described themselves as "curious." These students demonstrated more tolerance of ambiguity, and were less likely to demonstrate primacy when presented with descriptions of ambiguous others than were insecure students (Mikulincer, 1997). Secure attachment has also been associated with better processing and less defensive exclusion of threatening information and better recall of that information in a memory task (Zeijlmans van Emmichoven et al., 2003). Therefore, secure individuals may holistically,

flexibly, and accurately assess their environment, while insecure individuals may make narrow, rapid, and potentially inaccurate evaluations.

Adolescence is a particularly interesting time to study cognitive mechanisms associated with attachment organization, since around the age of 12, formal operational thought begins to emerge, allowing adolescents to think abstractly and meta-monitor their own thought processes (Inhelder & Piaget, 1958; Piaget, 1972). Adolescents who have difficulties correcting inaccurate cognitive schemas will evidence abnormal cognitive oscillations, which likely leads to an underestimation or lack of awareness of their own abilities and value in interpersonal situations (as reviewed by Jacobsen et al., 1994). The emergence of formal operational thinking and the consequent increased capacity for perspective taking and meta-monitoring may allow for working models to be revised and applied to new relationships during this developmental period (Allen & Land, 1999).

Interaction of Affect Management and Social-Cognitive Flexibility. The classic Yerkes-Dodson law of cognitive processing states that optimal cognitive processing occurs when levels of arousal are moderate and attention is sufficient (Teigen, 1995; Yerkes & Dodson, 1908). When arousal levels are high there is an overload of attention resources, a reduction of cue utilization, and a narrowing of focus to only the central features of the environment (Bugental et al., 1995). Theories of emotion and attention (Matthews & Harley, 1996; Matthews & Wells, 1999; Mogg & Bradley, 1999; Radke-Yarrow & Sherman, 1985) suggest that, since the attachment system is activated when interacting with important others, attachment-related arousal may impact the degree to which individuals are able to evaluate and perceive others. Highly aroused, insecure

individuals may expend their cognitive-emotional resources on regulating the attachment system, reserving fewer resources to attend to and cognitively evaluate social cues (Kobak & Cole, 1994). As noted before, neither dismissing individuals, who deactivate their attachment-related affective arousal to keep it suppressed and in check, nor preoccupied individuals, who hyperactivate their attachment-related affective arousal and are always focused on getting attachment needs met, would be expected to have the epistemic space to fully attend to social cues or completely/holistically evaluate interpersonal situations. They may be more likely to quickly and inaccurately assess interpersonal situations (i.e., demonstrate primacy, Mikulincer, 1997; Mikulincer et al., 2003).

Attachment Organization and Friendship Competence

The semi-conscious revisiting of attachment information during adolescence likely affects interpersonal expectations and influences how other important, intimate relationships, such as close peer and romantic relationships, are approached (Bretherton, 1985; Furman & Wehner, 1994; Hazan & Shaver, 1994; Roisman, Madsen, Hennghausen, Sroufe, & Collins, 2001; Waters & Cummings, 2000). As described above, secure adolescents are expected to be the most flexible and successful at revising cognitive-emotional models of self and others, whereas insecure adolescents are expected to be inflexible and resist challenging these models. In this manner, individuals may systematically process attachment information – and consequently peer relationships – in different ways (Kobak & Cole, 1994). However, there is little research directly aimed at elucidating the specific mechanisms of the cognitive-emotional models that may be

responsible for the systematic organization of interpersonal information (Bretherton, 1985) and, thus, the application of attachment organization to close peer relationships.

Nonetheless, research has robustly linked adolescents' attachment organization with various friendship competencies. Insecurity has been associated with adolescents lacking social skills (Allen, Marsh et al., 2002; Allen, Moore, Kuperminc, & Bell, 1998; Engels et al., 2001; Urban, Carlson, Egeland, & Sroufe, 1991), interpersonal competence (Weinfield et al., 1997), trust, vulnerability, and emotional closeness (Sroufe et al., 1999), as well as with high levels of self-reported peer conflict (Lieberman, Doyle, & Markiewicz, 1999) – all of which have been related to unsuccessful friendship formation and maintenance (e.g., Allen & Land, 1999; Engels et al., 2001). Therefore, understanding the cognitive-emotional mechanisms by which attachment organization may function may be important if we are to fully understand why parenting is associated with friendship competence (Allen, Hauser, & Borman-Spurrell, 1996; Kerns, 1996; Zimmerman, 1999)

Despite theories regarding the inter-relatedness of affective arousal, social-cognitive flexibility, and attachment organization (e.g., Bowlby, 1982; Bugental et al., 1995; Crittenden, 1994, 1995; Kobak & Cole, 1994), extant research has only begun to empirically explore these relationships as they predict psychosocial outcomes. Most studies exploring these relationships have investigated only young children (e.g., Jacobsen et al., 1994; Meins, 1997), which fails to adequately incorporate issues unique to adolescence such as the rise of formal operational thought and the increased

importance of friendships. Those studies that do use samples of adolescents/college students have relied entirely on self-reports of attachment status (e.g., Baldwin, Keelan, Fehr, Enns, & Koh-Rangarajoo, 1996; Mikulincer, 1997), which are not well correlated with attachment organization rated from AAIs (Crowell & Treboux, 1995). Due to the semi-conscious nature of the cognitive and affective aspects of working models of attachment, and the tendency for dismissing individuals to defensively exclude important relationship information, self-reported attachment status does not necessarily reflect the intrapsychic complexity of the way an individual may approach relationships (Cassidy & Kobak, 1988).

Hypotheses

The current project uses two studies to address these gaps and extend the extant literature by using interview-assessed attachment organization, exploring two potential mechanisms by which attachment organization may function (affective arousal and social-cognitive flexibility), and investigating their contribution to friendship competence in adolescence.

The following hypotheses guide the two studies:

Study 1: Mechanisms of Attachment Organization.

(1) Deactivation/hyperactivation of the attachment system, as well as attachment organization and states of mind, are likely to be associated with self-reports of attachment-related affective arousal.

   a. Teens with insecure-dismissing states of mind, as well as those who hyperregulate/deactivate their attachment system and defensively exclude

negative aspects of attachment relationships, are expected to report the least affective arousal.

b. Teens with insecure-preoccupied states of mind, as well as those who hyporegulate/hyperactivate their attachment system and become entangled with attachment information, are expected to report the most affective arousal.

(2) Teens with insecure states of mind, especially hyperactivating teens who are most likely to be hyper-vigilant to interpersonal threat, are likely to demonstrate the least social-cognitive flexibility as reflected by demonstrating more primacy.

(3) Teens' reporting the greatest amount of arousal are expected to be the least flexible with regard to social information (demonstrate the most primacy).

Study 2: Attachment Organization, Affective Arousal, and Cognitive Flexibility Predicting Friendship Competence.

(1) Teens' degree of affective arousal and social-cognitive flexibility are expected to directly predict friendship competence.

a. Since being unable to manage affective arousal is associated with poor friendship competence, reports of more affective arousal after the AAI should be most strongly related to lower levels of friendship competence.

b. Since disordered information processing is associated with poor interpersonal competence, teens who demonstrate the least social-cognitive flexibility (e.g., the most primacy) should be the most lacking friendship competence.

(2) Arousal and social-cognitive flexibility are expected to be associated with attachment organization and states of mind in the prediction of friendship competence.

a. To the extent that arousal and social-cognitive flexibility (e.g., primacy) are related to attachment organization, they are expected to at least partially mediate relationships between attachment organization/states of mind (including measures of de/hyperactivation of the attachment system) and friendship competence.

b. Arousal and social-cognitive flexibility (e.g., primacy) may interact with attachment organization and states of mind, as well as with de/hyperactivation of the attachment system, to predict friendship competence. Insecure teens, who report being the most aroused or who demonstrate the most primacy, should exhibit the least friendship competence.

Method

Overall Design

These hypotheses will be examined using data collected annually over the course of 3 years. These data were collected as part of a larger, NIMH-sponsored study of family and peer relationships (Allen, 1998-2002, 2003-2008).

Participants

Data from a final sample of 147 target teens (77 female) were collected over three annual waves of data collection when teens were approximately 13 years old (M = 13.41, SD = 0.62), 14 years old (M = 14.33, SD = 0.74), and 15 years old (M = 14.75, SD = 0.79). The sample is racially/ethnically and socio-economically diverse: 98 teens identified themselves as Caucasian and 49 as being from minority or mixed minority groups. Teens' parents reported a mean total family income of $30,000 - $39,999 per year (range: less than $5,000 to more than $60,000, see Table 1). At each wave, teens nominated their closest, same-gendered friend to be included in the study.

Teens were recruited from the seventh and eighth grades at a public middle school drawing from suburban and urban populations in the Southeastern United States. All eighth graders in one school year, and all seventh graders in two consecutive school years, were mailed letters explaining the project, which contained response postcards. Combinations of active and passive recruitment procedures were used to solicit participants. Some students were paid $5 if they returned the postcard giving us permission to contact them, and other students were asked to return the postcard only if they did not wish to be contacted. Additional recruiting efforts included passing out information about the study during lunch periods. Approximately two-thirds of individuals approached expressed willingness to participate in the study. Siblings of target teens and students already participating as a target teen's close friend were ineligible for participation.

Procedure

All participants completed interview sessions in separate rooms at a public University. All sessions lasted approximately two-and-one-half hours. During the first wave, teens and their parents each received $20 for participating in one interview session. Teens also received $20 for participating in the second wave, and $30 for participating in the third wave for attending similar sessions. Teens gave consent for their closest friend to be contacted for collateral participation all each wave. Friends received $15 in the first wave, $20 in the second wave, and $25 in the third wave for participating in one interview session. Teens received an additional $25 in the first wave, $20 in the second wave, and $25 in the third wave for coming back and participating with their friends. Not all data from all interview sessions were used in this study.

At the start of each interview session, interviewers reviewed the purpose of the study and obtained active, signed, informed consent. [3] Interviewers assured all participants at the beginning and throughout the sessions that information provided was confidential, except that which pertained to suicidal/homicidal ideation or child abuse. Interviewers offered to read measures to participants in order to ensure that illiteracy or other disabilities did not prevent participation.

Measures

Attachment Organization

The Adult Attachment Interview (Main, Kaplan, & Cassidy, 1985) is a semi-structured interview assessing attachment organization in adolescence/adulthood, and

[3] Parents provided signed, informed consent for all participants under the age of 18; teens under the age of 18 provided signed assent.

reflects how individuals internalize and process qualities of parent-child relationships. Trained graduate students gave the 40-minute interview during Wave 2 or 3, whenever the target teen was closest to 14 years old.[4] The interview consists of 19 questions designed to activate the attachment system, e.g., five adjectives and associated specific, episodic memories describing childhood relationships with parents, and memories of separations, being hurt/upset, being threatened/abused, and significant deaths. The interview and accompanying coding system assess affective and cognitive styles with which interviewees recall and describe childhood relationships (Main & Goldwyn, 1991).

A Q-sort rating system (Kobak, 1989), which closely parallels the AAI Classification System (Main & Goldwyn, 1991), was used. Transcribed interviews were rated on three continuums of attachment organization: secure, insecure-preoccupied, and insecure-dismissing, as well as on a deactivating-hyperactivating continuum. Raters read a transcript and provided a Q-sort description by assigning 100 items into nine categories ranging from most to least characteristic of the interview, using a forced distribution. These Q-sorts were then correlated with four dimensional prototype sorts developed by a panel of attachment experts (Kobak et al., 1993). The correlation of the 100 items of a participant's Q-sort with the 100 items from the prototype sort for each dimension was used as that participant's scale score for that dimension (range from –1.00 to 1.00).

The secure-insecure and the deactivating-hyperactivating scales most parsimoniously distill the differences between secure and insecure, and

[4] Attachment organization has been demonstrated to be stable during mid to late adolescence (Zimmerman & Becker-Stoll, 2002). Therefore, attachment organization was only assessed once, after most adolescents were likely to have entered formal operations (Piaget, 1964) and attachment organization is presumed to have become reasonably stable (Thompson, 2000).

preoccupied/hyperactivating and dismissing/deactivating attachment organizations; therefore, only those two scales were used in order to keep the number of statistical analyses to a minimum. Secure versus insecure interview strategies reflect the overall degree of coherence of discourse, the integration of episodic and semantic attachment memories, and a clear objective valuing of attachment. Deactivating versus hyperactivating strategies reflect the overall balance of dismissing and preoccupied styles with regard to managing affective arousal. Additionally, although the Q-sort methodology of coding the AAI's does not include a code for the disorganized attachment organization, coders did dichotomously rate whether or not teens experienced any loss or trauma (but not whether the teen was unresolved with regard to losses or trauma). In this project, the presence of the trauma/loss rating will be used in follow-up data analyses as a rough proxy for a disorganized attachment organization.

All transcripts were blindly rated by at least two, reliable raters with extensive training in both the Q-sort and the AAI Classification System. Intraclass correlations for the final scale scores were .81 and .87 for the secure and deactivating-hyperactivating scales, respectively. Assessing attachment organization from the AAI using the Q-sort scores is well-validated, reliable (Kobak et al., 1993), and has been demonstrated to be related to interpersonal competence (e.g., Allen, Leadbeater, & Aber, 1990; Allen et al., 1998).

A trained and reliable coder developed 5 subscales representing participants' states of mind regarding attachment, which are conceptually parallel to the states of mind scales in the Main and Goldwyn coding system (Main & Goldwyn, 1991): idealization of

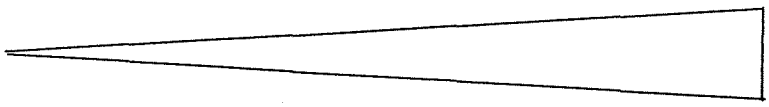
attachment figures (Cronbach's alpha .92), insistence upon lack of recall of attachment experiences (Cronbach's alpha .95), derogation of attachment figures (Cronbach's alpha .89), involved anger with attachment figures (Cronbach's alpha .83), and passivity of thought with regard to attachment experiences (Cronbach's alpha .88). Each subscale consists of 4 to 6 of the 100 Q-sort items (see Appendix B). The intraclass correlations for these states of mind scales are: idealization .80, lack of recall .84, derogation .81, involved anger .73, and passivity of thought .64.

Affective and Cognitive Mechanisms

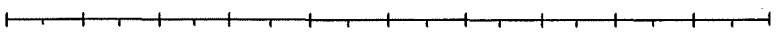
The Affective Arousal Scale (Appendix C) is a 5-item, self-report measure developed to quantify teens' subjective experience of attachment-related affective arousal. This scale was administered directly before[5] and immediately after the attachment interview (at which point the attachment system was presumed to be activated, e.g., Dozier & Kobak, 1992; Gunnar, Brodersen, Nachmias, Buss, & Rigatuso, 1996; Kobak & Cole, 1994; Main & Goldwyn, 1991). Teens were instructed to respond about how they were feeling *"right now"* and to complete a practice item ("How hungry are you right now?") designed to teach the visual analog scale and reference teens towards internal experiences. Teens then rated five negatively-valenced (sad, worried, angry, upset, tense) and three positively-valenced (happy, excited, cheerful) affects from "None At All" to "Very!" on a 100mm visual analog scale.

[5] Prior to the first administration of this measure, teens were not told they are about to be given the attachment interview. This procedure eliminated the possibility that knowing they will be asked questions about their childhood may have engendered some teens to report non-attachment anticipation/anxiety.

How **angry** are you right now?



NOT AT ALL VERY!



The negatively valenced items are of particular interest since insecure attachment organization is primarily characterized by anger and/or anxiety, and selective attention/restricted cognitive flexibility also is often associated with negative emotions (Mogg & Bradley, 1999). The positively valenced items were included so as to obscure the fact that we were primarily interested in negative affect.

The visual analog scale, on which experience may be rated on an uninterrupted continuum, was used to capture subtle variations in pre- and post- interview arousal. Such gradations of experience would not be possible using standard 5- to 9-point Likert-type scales. This application of a visual analogue scale is supported by its common utilization and demonstrated validity in assessing highly subjective experiences, ranging from quality of life to level of physical pain, that can be rated on a "less-to-more" continuum (e.g., Goodnick, Mendosa, Kumar, Freund, & DeVane, 2000; Rubinow, 1984; Vranken, Zuurmond, & de Lange, 2001; Wang, Svensson, & Arendt-Nielsen, 2000). Scores were obtained by measuring how many millimeters from the "None At All" end of the scale the adolescent placed a hash-mark.

Each teen's relative change in affective arousal was computed by subtracting the sum of the teen's ratings pre-interview from the sum of their ratings post-interview. Higher scores thus reflect greater attachment-related arousal post interview. Since affective hallmarks of insecure attachment are anger and/or anxiety, the "upset" and "angry" items, as well as the "tense" and "worried" items, were each combined to create change in angry arousal and change in anxious arousal scales, respectively. Cronbach's alpha coefficients also demonstrate adequate internal consistency for these two subscales: .87and .90 for pre- and post-interview angry arousal, respectively; .67and .68 for pre- and post-interview anxious arousal, respectively.

Zimmerman (2001), used a similar self-report measure to assess current mood with adolescents in a study of emotion regulation and attachment organization, which used a 7-point, Likert-scale. Similar adjective checklists are used commonly to assess self-reports of arousal, and have been found to be correlated with physiological measurements of arousal (e.g., skin conductance and heart rate), and have been demonstrated to be useful and valid (Thayer, 1967, 1970, 1986). Additional research on test-retest reliability of adjective checklists have suggested that self-report arousal validly measures transient arousal (Matthews, Davies, & Lees, 1990; Matthews, Jones, & Chamberlain, 1990).

The Social-Cognitive Flexibility Measure (Appendix D) was administered directly following the post-interview Affective Arousal Scale. This measure consists of eight vignettes designed to measure the degree to which teens demonstrate social-cognitive inflexibility via forming rapid social impressions (e.g., demonstrate a "primacy

effect" by attending only to the first bit of information presented while largely ignoring subsequent information, Asch, 1946). This measure is similarly constructed to other measures of primacy for social impression formation (Ikegami, 1993; Mikulincer, 1997; Webster & Kruglanski, 1994), which present scenarios that alternately present positive information followed by negative information and negative information followed by positive information. Audio-taped vignettes were presented about hypothetical adolescents (of the same gender as the target teen) across four dimensions of sociability (niceness, friendliness, honesty, and generosity). After listening only once to the vignette, teens rated their impression of the character on one of the sociability dimensions using a 7-point, Likert-type scale, e.g., 1 = "very unfriendly" to 7 = "very friendly." The orders of positive and negative information, as well as the sociability dimensions, were alternated throughout the measure.

As illustrated below, the degree to which teens demonstrated primacy (i.e., formed rapid impressions of the characters) was calculated by summing the positively begun items and the reverse coded negatively begun items. Higher scores thus reflect a greater tendency to demonstrate primacy and rate the character consistently with the first bit of information provided (regardless of negative-positive valence of the information). Since the purpose of this total was to measure the degree to which teens demonstrate primacy, which is a construct superimposed on a measure overtly assessing personality characteristics, the Cronbach's alpha statistic was not used to test internal consistency.[6]

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[6] The Cronbach's alpha for this scale is -.15, and is not unexpected. All items for this scale are designed so that equally positive and negative aspects of each character's personality presented, but all items are scored on a 'not nice'=1 to a 'nice'=7 continuum. Since half the items are reverse

EX: Positive-Negative "Friendly" Scenario

You think this girl Gina is pretty cool. *[POSITIVE:]* You are kind of excited because in 4th period she invited you to a party she's having this weekend. Plus, a couple of weeks ago she also asked you to hang out at the mall. *[NEGATIVE:]* After school you see Gina getting her books out of her locker. You say "hi," but she ignores you. You don't know what's up with her. She went to sit next to some other people at lunch today and didn't ask you to join them.

**Higher scores reflect more positive impressions and more primacy.*

EX: Negative-Positive "Friendly" Scenario

On your way to lunch, you pass by your friend Marguerite who is talking to a group of people about this other girl you know. *[NEGATIVE:]* Marguerite is saying that sometimes this girl can be a real jerk. Marguerite can be really hard to get along with; you've heard her sometimes say some other rude things about people too. You go to get your lunch and on the way to sit down you pass Marguerite again. *[POSITIVE:]* She is saying that it's too bad that Patrice is absent today because she just really likes her. Marguerite always wants to include everyone in what she does; in fact, last week she went out of her way to invite you to a party she was having.

**Higher scores reflect more positive impression and less primacy (therefore, negative-positive scenarios are reverse coded for analyses).*

The positive and negative portions of each scenario were separated and pre-tested, using the same 7-point Likert scales described above, with 20 undergraduate and graduate students studying adolescent development. The mean rating for the negative scenario portions was 2.08 (SD = .31) and the mean rating for the positive scenario portions was 6.51 (SD = .41) indicating that the scenario portions did indeed reflect negative and positive aspects of sociability. On the average, the positive and negative

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coded, they are negatively correlated with the other half of the items (r=-.47), thus dramatically reducing the apparent internal consistency of the measure. Given the potential value of investigating the primacy construct, the primacy total will be used with some prudence.

scenario portions were each reliably different from the mid-, neutral-point of the scale (positive: $t(19)=27.17$, $p \leq .0001$, negative: $t(19)=-27.48$, $p \leq .0001$). Teens in the studies presented here rated the combined positive-negative scenarios approximately at the mid-point of the scale ($M = 4.25$, $SD = .87$), indicating that, on average, they also perceived the negative and positive aspects of the scenarios to be essentially equal. Extant research links social impression formation to attachment styles (Mikulincer, 1997), negative mood (Ikegami, 1993), and a need for cognitive closure (Webster & Kruglanski, 1994).

Friendship Competence

Three friendship competency scales were constructed: (1) close friends' reports of teens' friendship competence in Wave 3, (2) teens' self-reports of friendship competence in Wave 3, and (3) observer rated dyadic friendship competence in Wave 2. Wave 3 friendship competence were used because, as teens age, friendships are expected to deepen (e.g., Buhrmester, 1996; Engels et al., 2001; Furman, 1999), and by age 15 or 16 the quality of friendships (and teens' behavior in them) may be more likely to reflect attachment relationships (Engels et al., 2001). However, observer rated dyadic friendship competence was not available for Wave 3 at the time of analysis, so Wave 2 data were used.

A Close Friend-report of Teen Friendship Competence scale was constructed by standardizing and taking the mean of the items of Friendship Quality Questionnaire (Parker & Asher, 1993), the Interpersonal Competence Questionnaire (Buhrmester, 1988), and the Inventory of Parent and Peer Attachment (Armsden & Greenberg, 1987b), answered by friends about teens, which are described below. Cronbach's alpha for this

combined scale is .98.

A Teen-report of Friendship Competence scale was constructed by standardizing and taking the mean of the items of the Friendship Quality Questionnaire (Parker & Asher, 1993) and the Inventory of Parent and Peer Attachment (Armsden & Greenberg, 1987b), answered by teens about themselves, which are described below. (Teens were not administered the Interpersonal Competence Questionnaire.) Cronbach's alpha for this combined scale is .96.

The *Friendship Quality Questionnaire* (Parker & Asher, 1993) is a commonly used, 40-item, self-report measure completed by friends about teens and by teens about themselves. The six subscales (intimate exchange, conflict resolution, companionship/recreation, help/guidance, validation/caring, conflict/betrayal) have been shown to be reliable and valid (Parker & Asher, 1993).

The *Interpersonal Competence Questionnaire* (Buhrmester, 1988) is a commonly used, 40-item, self-report measure completed by friends about the teens. The five subscales (relationship initiation, negative assertion, self disclosure, conflict management, and emotional support) have been shown to be reliable and valid (Buhrmester, 1988, 1990).

The *Inventory of Parent and Peer Attachment* (Armsden & Greenberg, 1987b) is a commonly used, 25-item, self-report measure completed by friends about the teens' friendships and by teens about their own friendships. The three subscales (communication, trust, and

alienation) have been shown to be reliable and valid (Armsden & Greenberg, 1987a).

An Observed Friendship Competence scale was computed by taking the mean of 11 scales coded using the *Supportive Behavior Task Coding Manual* (Allen, Insabella, Hall, Marsh, & Porter, 1999, Cronbach's alpha .79). Teens were asked to discuss a "problem they were having that they could use some advice or support about" for six minutes with their friend. Topics typically included dating, problems with other peers, siblings, or parents, raising money, and deciding about joining sports teams.

Two trained, reliable raters blindly coded each interaction. The teen and the close friend were each rated on eleven scales across four domains: *affect domain* (scales: valuing, negative affect), *process of the interaction domain* (scales: engagement, talking about 3rd persons, self disclosure), *support domain* (scales: instrumental support called for – teen only, emotional support called for – teen only, instrumental support given – close friend only, emotional support given – close friend only), and *overall quality of the interaction domain* (scales: satisfaction – teen only, interpretation of problem – close friend only). The domain scores were combined to form a total score reflecting the overall supportive quality of the interaction (intraclass correlation = .85).

Development of the scales for this coding system were based on several other dyadic coding systems of social support (Crowell et al., 1998; Haynes & Fainsilber Katz, 1998; Julien et al., 1997), and were designed to capture attachment-type behaviors such as willingness to communicate distress/seeking a secure base, and ability to be soothed by others. Preliminary analyses demonstrate that qualities of interactions with close friends

are related in expected directions to attachment organization, expectations of mothers (Porter, 2001), and delinquency (Allen, Porter, & Tencer, 2002).

Results

Preliminary Analyses

Demographics. Although there are no specific study hypotheses regarding the effects of gender, it was examined as a potential moderator of all independent and dependent variables to account for ways in which gender may alter interpretations of findings.

Adolescents Without Close Friend Data. Analyses were conducted to examine potential differences between 25 teens who were missing close friend-report data and/or close friend observational data[7] and the 122 teens with complete data: The 5 teens who were missing both the friend-reported and observational data demonstrated significantly less involved anger states of mind ($t(145) = -2.46$, $p \leq .05$). The 11 teens who were missing only friend-reported data demonstrated less of a tendency to demonstrate primacy ($t(131) = 2.01$, $p \leq .05$). The 9 teens who were missing only observation data demonstrated less passive states of mind ($t(129) = -1.96$, $p \leq .05$), and less of a tendency to demonstrate primacy ($t(129) = 2.32$, $p \leq .05$).

The absence of these data precluded including these teens in all of the primary analyses presented below. While the first set of these preliminary analyses indicate that teens without friend data may be more characteristically dismissing (as would be

[7] These data may be missing for a variety of reasons: (1) these adolescents may have been unable to nominate a friend for participation, (2) nominated friends may not have been able to participate, and/or (3) some collected data might not have been available at the time of analysis.

expected), the second two sets of analyses contradict the proposed hypotheses in that the teens without some friend data generally appear to be less characteristically dismissing and not to demonstrate primacy. However, since these data are missing for a variety of reasons, implications of these results cannot be assessed.

Correlations. Zero-order correlations, as well as means and standard deviations, of all variables are presented for descriptive purposes in Table 2. Moderate correlations were found between many measures. These correlations are examined further in the analyses that follow.

Primary Analyses

Study 1. Hypothesis 1: Deactivation/hyperactivation of arousal regarding attachment, as well as attachment organization and states of mind, are likely to be associated with self-reports of attachment-related affective arousal. Hierarchical regression analyses were used. Follow-up interactions with gender were examined for all models, and revealed one statistically reliable result.

Neither anxious nor angry arousal were directly associated with attachment organization or states of mind. However, the interaction between gender and anxious arousal revealed that boys who report less anxiety are also more deactivating of attachment (Table 3, Figure 1, $\beta = .20$, $p \leq .05$).

At least for boys, having a deactivating attachment organization is associated with reporting less anxious arousal.

Post hoc analyses were used to explore deactivation scores by gender. Boys were rated as significantly more deactivating than girls ($t(142)=3.76$, $p \leq .0001$, boys $M = .24$, $SD = .26$; girls $M = .02$, $SD = .25$).

Hypothesis 2: Teens with insecure states of mind, especially hyperactivating teens who are most likely to be hyper-vigilant to interpersonal threat, are likely to demonstrate the least social-cognitive flexibility as reflected by demonstrating more primacy. Hierarchical regression analyses were used. Follow-up interactions with gender were examined for all models, and revealed no statistically reliable results.

Although it was hypothesized that less primacy would be associated with less security, primacy was revealed to be associated with more security (Table 4, $\beta = .17$, $p \leq .05$) as well as with less deactivation/more hyperactivation (Table 5, $\beta = -.21$, $p \leq .01$). Primacy was associated in a similar pattern with several attachment states of mind: less idealization (Table 6, $\beta = -.26$, $p \leq .001$), less insistence upon lack of recall (Table 7, $\beta = -.22$, $p \leq .01$), and less derogation (Table 8, $\beta = -.16$, $p \leq .05$), as well as with more involved anger (Table 9, $\beta = .20$, $p \leq .01$).

Contrary to the proposed hypotheses, secure and less deactivating/more hyperactivating attachment organizations are associated with more primacy (attending more to the first bit of information presented); these results also conversely indicate that more insecure and deactivating attachment organizations are associated with recency (attending more to the last bit of information presented). *The state of mind typically associated with hyperactivating attachment organization (involved anger) also was associated with primacy, and states of mind regarding attachment typically*

associated with deactivating attachment organization (idealization, insistence upon lack of recall, and derogation) were also associated with recency.

Post hoc analyses were used to explore deactivation and primacy scores by attachment category.[8] One-way ANOVA results, exploring attachment category and degree of deactivation revealed statistically reliable differences between the three attachment categories ($F(2, 143) = 190.22$, $p \leq .0001$). Least squared difference test follow-up analyses demonstrate that the dismissing mean is statistically reliably different than the secure and preoccupied means ($p \leq .0001$), and that the secure and preoccupied means are different at a trend level ($p \leq .07$; see Table 10). Additional one-way ANOVA results, exploring attachment category and degree of primacy revealed no statistically reliable differences between the three attachment categories ($F(2, 143) = 1.95$, $p =$ ns). However, the magnitudes of the primacy means do increase from dismissing to secure to preoccupied (Table 11).

Hypothesis 3: Teens reporting the greatest amount of arousal are expected to be the least flexible with social information (demonstrate the most primacy). Hierarchical regression analyses were used. Follow-up interactions with gender were examined for all models and revealed no statistically reliable results.

[8] Although the Q-sort system was designed to yield continuous measures of qualities of attachment organization, a primary attachment classification may be calculated by simply identifying the largest Q-scale score above .20 (Kobak et al., 1993). When transcripts have been scored using the Q-sort and then compared to AAIs classified by an independent coder with well-established reliability in classifying AAIs using the Main & Goldwyn, 1991 method, kappas have been reported to range from .56 (74% with identical codes) to .68 (84% matched in terms of security versus insecurity, Allen, Marsh et al., 2002); one teen did not meet classification cutoff criteria and, therefore, was not classified into one of the three attachment groups.

No statistically reliable relationships between primacy and anxious or angry arousal were revealed.

Study 2. Hypothesis 1. Teens' degree of affective arousal and social-cognitive flexibility are expected to directly predict friendship competence. Hierarchical regression analyses were used. Follow-up interactions with gender were examined for all models, and revealed one statistically reliable result that is presented below.

No statistically reliable relationships were revealed between angry arousal, primacy, and any friendship competence.

One relationship between anxious arousal and friend-reported friendship competence revealed that boys who reported more anxious arousal were perceived as being better friends than boys who reported less anxious arousal (Table 12, Figure 2, $\beta = -.28$, $p \leq .01$); an opposite and substantially attenuated pattern was observed for girls, who were rated higher in friendship competence overall.

Boys reporting less anxious arousal (i.e., those who are likely more deactivating, see results for Study 1, Hypothesis 1), are not seen by their friends as being especially interpersonally competent.

Hypothesis 2. Affective arousal and social-cognitive flexibility are expected to be associated with attachment organization and states of mind in the prediction of friendship competence. Hierarchical regression analyses were used. Follow-up interactions with gender were examined for all models, and revealed one statistically reliable result, presented below.

Teens' self-reported friendship competence and observed friendship competence were not statistically reliably predicted by the interactions of attachment organization or states of mind with arousal or primacy. There was also no evidence of a relationship between friend-reported teen friendship competence and primacy.

Friend-reported teen friendship competence was predicted by one interaction: girls were rated highest in friendship competence if they were low in involved anger, especially if they also reported less angry arousal. However, boys were rated high in friendship competence if they either reported more angry arousal and had less involved anger or if they reported less angry arousal and had more involved anger (Table 13, Figure 3, $\beta = .24$, $p \leq .05$).

Girls were generally rated by friends as being high in friendship competence, but generally higher if they had less involved anger (more secure functioning), or if they reported less angry arousal. Boys were rated most highly in friendship competence if they demonstrated low involved anger and high angry arousal or high involved anger and low angry arousal.

Follow-up Analyses

Post Hoc Data Exploration. Three additional sets of analyses were conducted to rule out the possibility that the relatively straightforward plan of analysis may have resulted in the preponderance of null findings described in the primary analyses above. Because the risk of Type I errors was already high, additional analyses were kept to a minimum and only key models were explored.

First, curvilinear relationships between affective arousal, primacy, deactivation and friendship competence were explored. Affective arousal possibly could be curvilinearly associated with the deactivation and/or friendship competence, e.g., teens in the middle of the deactivation-hyperactivation continuum and those with the most friendship competence may be those who report a moderate amount of arousal. Additionally, primacy could possibly be predicted curvilinearly by deactivation, with the most secure teens demonstrating the least primacy. To test these hypotheses the squares of the anxious and angry arousal variables were used to predict deactivation and friendship competence (friend-report, teen-report, and observed), and the square of the deactivation variable was used to predict primacy. Only two statistically reliable results were revealed: (1) angry arousal was quadractically associated with deactivation of the attachment system (Figure 4, $\beta = .21$, $p \leq .05$), and (2) anxious arousal was quadractically associated with observed friendship competence (Figure 5, $\beta = .23$, $p \leq .01$).

Teens who reported moderate angry arousal were slightly hyperactivating; deactivating teens either reported low or high angry arousal. Teens exhibiting the most friendship competence were those who reported a moderate amount of anxious arousal. Teens reporting the most anxious arousal demonstrated lower friendship competence, and teens reporting no anxious arousal demonstrated the lowest friendship competence.

Second, the direct relationships of anxious arousal, angry arousal, and primacy with security, deactivation, and friendship competence were examined separately for each of the three categorical attachment categories. This was done to rule out the possibility

that statistically reliable results were obscured by relying on continuous markers of security-insecurity and deactivation-hyperactivation, when in fact the scales might work differently between the three categorical groups (i.e., secure teens, dismissing teens, and preoccupied teens). Only one statistically reliable result was revealed: for preoccupied teens (N = 10) deactivation was associated with less anxious arousal ($\beta = -.75$, $p \leq .05$).

Preoccupied teens who were rated as being the most deactivated also reported the least anxious arousal.

Third, the primacy scale was broken down into primacy for positively begun items and primacy for negatively begun items. This was done to explore the possibility that primacy might be stronger if potential threat were perceived first (i.e., primacy might be stronger for negatively begun items). Only one statistically reliable result was revealed: primacy for positively begun scenarios was associated with being more hyperactivating ($\beta = -.16$, $p \leq .05$).

Attending to the first bit of information presented, if it is positive, is associated with being more hyperactivating.

The following issues might potentially impact the studies' findings and were examined for all statistically reliable relationships revealed in the primary analyses for Studies 1 and 2, described above.

Length of Time between AAI and First Wave of Data Collection. The AAI was given either in Wave 2 or Wave 3, whenever the teens were closest to 14 years of age. Since attachment organization is presumed to be reasonably stable during mid to late

adolescence (Zimmerman & Becker-Stoll, 2002), this methodological variation was not predicted to impact findings. However, the length of time between the date of the target-teens' first visit in Wave 1 and the date when the AAI was administered was examined as a possible moderator of all statistically reliable results predicting friendship competence (results reported for Study 2). There was no relationship found between when the AAI was given and friend-reported teen friendship competence.

Impact of Socioeconomic Status. Several studies demonstrate more instances of insecure attachment organization when investigating samples from poor socioeconomic and/or at-risk populations. This frequency of insecurity is likely due to the increased levels of stress and scarce resources for poorer families (Booth et al., 1991; Bretherton, 1985; Easterbrooks, Davidson, & Chazan, 1993; Easterbrooks & Graham, 1999; van Ijzendoorn & Bakermans-Kranenburg, 1996). There is also a body of research that describes how attachment status may vary depending on cultural norms (Ambert, 1994; Bretherton, 1985; Fish, 2001; Harwood & Miller, 1991). Therefore, to the extent that race/ethnicity reflect socioeconomic status (and the accompanying stress/scarcity) and/or cultural perspectives on parenting, both race/ethnicity and gross family income were expected to mediate the effects of attachment organization on outcomes.

When minority status and family income were added as a block of mediators into all statistically reliable models, approximately half results fell to statistically unreliable levels (the original results are presented in Tables 3, 4, 6, and 8). The finding that boys who reported more anxious arousal were more deactivating fell to a trend level after accounting for income and ethnicity. The relationships between primacy and less

idealization, less derogation, and more security also fell to trend levels or became statistically unreliable. Nonetheless, the relationships between primacy and less lack of recall, less deactivation, and more involved anger remained robust. Also preserved were the predictions of friendship competence.

The Impact of Traumatic Events. Unresolved or disorganized attachment occurs in roughly 15% to 25% of the population (as reviewed by, Main, 1996). Disorganized attachment is associated with a host of poor outcomes, including psychopathology and disruptive and aggressive school behavior (as reviewed by, Main, 1996) as well as possibly maladaptive patterns of interacting with peers (at least in preschool years, Jacobvitz & Hazen, 1999). Therefore, the AAI coders' dichotomous ratings regarding whether or not teens experienced loss or trauma were combined and examined as a possible moderator of all reliable results in follow-up analyses. Although there is no rating for how many teens were unresolved, out of the entire sample, 28 teens (18.5%) were rated as having ever experienced either loss or trauma by any of the coders. Ten could also be categorized as dismissing (7%), 15 as secure (10%), and 2 as preoccupied (1%).

These analyses revealed two instances where experiencing loss/trauma impacted the relationships between dependent and independent variables (the original results are presented in Tables 4 and 6) – both regarding the relationship between primacy and measures of attachment. There was essentially no relationship between primacy and security for teens who did experience trauma, while primacy was still associated with security for teens who did not experience trauma (Figure 6, $\beta = -.17$, $p \leq .05$). Similarly,

for teens who experienced trauma, there was only a weak relationship between primacy and less idealization, while there was a robust relationship between being less idealizing and demonstrating more primacy was maintained for teens who did not experience trauma (Figure 7, $\beta = -.17$, $p \leq .05$).

When teens were rated as experiencing a trauma and/or loss, primacy was no longer related to attachment security or idealization of attachment figures.

Discussion

The current project included two studies designed to address specific gaps in the literature on links between parenting and peer outcomes for adolescents. Possible cognitive-emotional mechanisms that may mediate links between qualities of parent-adolescent relationships (as measured by interview-assessed attachment organization) and friendship competence during adolescence were examined. Attachment-related affective arousal and social-cognitive flexibility were not related with one another in predicting attachment organization, de/hyperactivation of attachment, or attachment states of mind. There was some evidence that attachment-related affective arousal was associated with deactivation of the attachment system in predictable ways (for boys), that affective arousal interacts with attachment states of mind when predicting friend-reported friendship competence (more dramatically for boys than girls), and that insecure adolescents may not cognitively process social information effectively. These findings are summarized and discussed below. Directions for future research, as well as limitations of the current project, also are presented.

Affect Management Mechanism

Analyses revealed that there are some relationships between attachment-related affective arousal, measures of attachment, and friendship competence, with somewhat different patterns apparent for boys and girls. Deactivation of the attachment system was associated with male teens reporting less anxious arousal, and those boys being rated lower by close friends in friendship competence. This is consistent with evidence that dismissing individuals are less likely to self-report negative aspects of attachment relationships (Crittenden, 1995; Dozier & Kobak, 1992; Kobak & Cole, 1994) but are perceived by peers as more hostile (Kobak & Sceery, 1988; Mikulincer, Hirschberger, Nachmias, & Gillath, 2001; Mikulincer & Shaver, 2001). Insecurity also is associated with many aspects of social maladjustment (e.g., Allen & Land, 1999; Allen, Marsh et al., 2002; Allen et al., 1998; Allen, Porter et al., 2002; Engels et al., 2001; Lieberman et al., 1999; Sroufe et al., 1999; Urban et al., 1991; Weinfield et al., 1997); therefore, not surprisingly, friends rated boys who exhibited markers of insecure attachment lower in friendship competence. Deactivating boys may be less aware of their own affective states and, accordingly, less perceptive of their friends' emotional needs and/or generally less engaged in friendships (a hypothesis that is supported by the fact that no relationships between arousal and teens' reports of friendship competence were revealed). Post hoc analyses demonstrated that the boys in this sample used deactivating strategies to a greater degree than girls. Girls average degree of deactivation, and consequently their awareness of or willingness to report anxious arousal, may not have been low enough as to significantly impact their friends' perceptions of the girls' friendship competence. In a

sample with a greater number of deactivating girls, there may be evidence of the same interpersonal impediments demonstrated here for boys.

Analyses also revealed that, on average, a high level of involved anger – a marker of attachment insecurity characterized by the expression of uncontained, unmonitored, and/or strongly over-involved anger with attachment figures – was associated with low friendship competence for boys and girls, providing support for links reported in the extant literature between insecurity with parents and social maladjustment. However, angry arousal was shown to impact boys' and girls' friendship competence differently. Boys were rated highly in friendship competence if they demonstrated low involved anger and high angry arousal or high involved anger and low angry arousal. Whereas girls were rated higher than boys in friendship competence on average, girls friends rated them lower in friendship competence if they demonstrated more involved anger or if girls' reported more angry arousal.

Teens who are willing or able to report attachment-related angry arousal may be more likely to *express* interpersonal anger. Boys with markers of insecurity (i.e., involved anger) may be able to manage peer relationships only if they (defensively or consciously) keep their angry arousal in check. Angry arousal may become problematic for less regulated, overly involved boys because it may manifest in friendships and be more threatening to those relationships. For more regulated boys (i.e., those with less involved anger), angry arousal was not associated with poor friendship competence – perhaps reflecting these boys' adaptive social skills and their ability to appropriately express negative affect. However, for more regulated girls (i.e., those with less involved anger)

angry arousal does appear to be detrimental. This relationship for girls may reflect the literature of differences between standards of angry expression between girls' and boys' peer groups: for girls, expressing interpersonal anger often may be viewed or expressed as relationally aggressive (e.g., Crick et al., 1999). Alternatively, since girls are rated more competently than boys on average, expressed anger may be more rare and, therefore, perhaps more detrimental to girls' relationships. Lastly, attachment-related angry arousal may not reflect a tendency to express more interpersonal anger; it may reflect either more current anger with parents and/or a more irritable temperament. Either of these possibilities may make teens who report more angry arousal less appealing for peers to be around.

Whereas the results presented here generally support the existence of relationships between attachment-related affective arousal, markers of attachment, and friendship competence, they are less than convincingly clear. The relationships between reported affective arousal and attachment were scant: there were no relationships between angry arousal and attachment. One relationship between anxious arousal and de/hyperactivation of the attachment system was revealed, but there were no relationships between anxious arousal and attachment security or states of mind. Friend-reported friendship competence was only predicted by (1) anxious arousal for boys, and (2) the interaction of angry arousal and involved anger with attachment figures. The latter finding is not directly supported by the former finding, and is complicated and difficult to interpret. Furthermore, the results represent only 3 findings in a fairly large plan of analyses examining the inter-relationships between arousal, attachment and friendship

competence. The fact that they may be an effect of statistical chance (Type I error) cannot be disregarded.

Post hoc analyses were conducted to explore curvilinear relationships of anxious and angry arousal with de/hyperactivation of the attachment system and friendship competence, as well as the relationships between these variables for each of the three attachment categories (i.e., dismissing, secure, and preoccupied). As would be expected, moderate arousal was demonstrated to be associated with better functioning, and preoccupied teens demonstrating more deactivation reported less anxious arousal. These findings generally support the results from the primary analyses and are consistent with theory on which this project was based. However, as with the primary analyses, these findings were neither extensive nor robust and generally not thought to bolster the validity of the primary analyses.

A couple of methodological nuances also may have contributed to the lack of findings. First, whereas the anxious and angry arousal scores exhibited good range, on average they were close to zero – indicating little change in teen-reported arousal pre- and post- AAI. The AAI may not have elicited enough affect for our young, normative population of adolescents to accurately perceive and/or self-report. In a more high-risk sample, with a larger number of preoccupied/hyperactivating individuals, the range of and change in pre- and post- scores may have been more profound and apt to yield statistically reliable results, or a more sensitive measure of arousal may be more successful at elucidating relationships between arousal, attachment, and friendship competence. Additionally, while the affective arousal scale sought to tap affective

distress specifically elicited by the attachment interview, it likely also measured distress elicited by the interview process, the interaction with the interviewer, and thoughts and feelings that may have only be tangentially related to the attachment process (i.e., thoughts about a fight with a boyfriend earlier that day). This type of affective "noise" may have made relationships between the affect scale and attachment organization more difficult to detect. Further research could begin to address these issues by studying more high-risk/disordered populations and/or using more objective measures of affective arousal (such as galvanic skin response or the number and type of affective words used during the interview).

Why relationships between affective arousal and observed friendship competence were not found is also unclear. If dismissing/deactivating teens defensively exclude negative relationship information, then self-reported attachment-related affective arousal and self-reported friendship competence would be expected to be unrelated. However, relationships between affective arousal and friend-reported and observed friendship competence should be comparable. One possible explanation for this lack of findings may be that the way attachment-related arousal manifests in friendships might not be observable (at least by the methods employed in this study). Reporting affective arousal may not be simply associated with a parallel willingness to express affect, but may more directly impact something like the intensity or overall closeness of the relationship. The observational coding system used in this study assesses many signs of engagement, intimacy, warmth, and level of comfort involved in problem solving (including willingness to call for support). However, there is no score for relationship intensity or

closeness. While many aspects of relationship dynamics and attachment behavior may be evident in these interactions, friends themselves may better report the longer-term intensity or closeness of the friendship. Alternatively, the observational coding system may capture something notably different than friendship competence. While teen- and friend-reported teen friendship competence are relatively highly correlated with one another, they are only modestly correlated with the observational rating summary score: the coding system was developed to assess for attachment-like behaviors while the paper and pencil measures assess a broad range of interpersonal competence including enjoying spending time together, enjoying similar activities, and general level of interpersonal comfort. Lastly, the observational data were collected one year prior to the friend-reported data because Wave 3 observational data are not currently available. The friend-reported data may have evidenced more salient relationships with attachment and arousal because, on average, teens and friends may have had more intimate relationships by that time (e.g., age 15 versus age 14).

Overall, further research may be needed investigating differences in the prevalence of deactivating strategies between boys and girls during the course of adolescence, and how this may impact the development of friendship competence. There may be differences in the degree of boys' and girls' use of deactivating/hyperactivating strategies at distinct points during adolescence – even if there are no differences in the categorical ratings of attachment in adulthood. Evidence of differences between boys' and girls' use of deactivating attachment strategies could lend useful insights into how working models are revised and extended to other relationships over the course of

adolescence and adulthood. Boys and girls may follow unique growth trajectories during adolescence that could effect the ways in which meta-monitoring may allow for working models of attachment with parents to be revised during adolescence, and consequently the ways in which friendships are approached. Further research may use longitudinal models extending into late adolescence to investigate this possibility. Understanding how activation of the attachment system may differentially affect boys and girls may guide interventions aimed at improving maladaptive peer interactions during adolescence.

Social-Cognitive Flexibility Mechanism

Relationships between social-cognitive flexibility, measures of attachment, and friendship competence were evident, but interestingly, directly opposing study hypotheses. Based on a literature of self-reported attachment style (e.g., Baldwin et al., 1996; Mikulincer, 1997), insecure adolescents were expected to be hyper-vigilant to potential interpersonal threat and therefore demonstrate social-cognitive primacy when judging others. However, results indicated that more secure attachment organization, as well as more hyperactivation of the attachment system, were associated with primacy. Similarly, a preoccupied state of mind was also associated with primacy (i.e., involved anger), while dismissing states of mind were associated with recency (i.e., idealizing, lack of recall, and derogation).

While at first puzzling, the consistency of these results compels interpretation. Primacy for both hyperactivated and secure teens makes sense if attachment security is considered on a continuum from deactivation to hyperactivation, with security falling at the mid-point. To the extent that secure and preoccupied individuals are in fact more

hyperactiving than dismissing individuals, they may more closely attend to only the first bit of information presented – as hyperactivated individuals are more attentive to potential interpersonal threat. Teens on the secure to preoccupied continuum, who were more readily aroused and more attentive to getting attachment needs met, may be more likely to form rapid social impressions when encountering new people. They may be inclined to categorize people as threatening vs. non-threatening so as to be able to adjust expectations about how others' may react to their needs. In support of these suppositions, the magnitudes of the primacy scores do increase from dismissing to secure to preoccupied teens, suggesting that secure and preoccupied individuals possibly may be cognitively distinct. However, in our normative sample, we do not see the extremes of preoccupation/hyperactivation – post hoc analyses revealed that the deactivation scores for the 10 preoccupied individuals were not reliably distinguishable from the 86 secure individuals. If the sample had a larger representation of preoccupied teens (e.g., as in a higher-risk or clinical sample), the distinction between secure and preoccupied teens may have been more robustly evident.

Dismissing/deactivating teens would demonstrate recency if they failed to fully attend to social information, only attending to what was lingering in auditory memory when asked to judge the information presented. Recency for dismissing individuals has not been evidenced in the literature, but may be due to those studies having only used self-reported measures of attachment style (i.e., Mikulincer, 1997). Since dismissing individuals tend to avoid processing potential interpersonal threats (Cassidy & Kobak, 1988; Main et al., 1985), and defensively exclude negative aspects of attachment

relationships (Crittenden, 1995; Dozier & Kobak, 1992; Kobak & Cole, 1994), individuals with dismissing attachment organization would be less likely to self-report a dismissing attachment style – many would likely self-report a secure style. While it is unclear who self-reports a dismissing style, the possibility that there was a preponderance of individuals with dismissing attachment organization in the self-reported secure style category may have led to the conclusion that insecurity (i.e., primarily self-reported preoccupied style) was associated with primacy. Since the measure of primacy used in these studies was similar to those used in other studies, replication of these findings in another sample, using interview-assessed attachment organization, would be necessary to rule out this hypothesis.

While the findings of the relationship between primacy and attachment organization were relatively consistent and interesting, there were no findings evidenced between primacy and affective arousal or friendship competence. While social-cognitive processing may be a result of or associated with attachment organization, it may not be directly associated with arousal or friendship competence. However, extant literatures on the inter-dependence of cognition and affective arousal (e.g., Bowlby, 1982; Bugental et al., 1995; Crittenden, 1994, 1995; Kobak & Cole, 1994) and the deleterious effects of faulty social-information processing (e.g., Cassidy et al., 1996; Dodge, 1993; Dodge & Schwartz, 1997; Lochman & Dodge, 1994, 1998), suggest this is not likely the case. Perhaps some third social-cognitive process such as attention to social details or memory for interpersonal events, rather than primacy when judging others, links social-cognition and attachment organization to arousal and friendship competence. Future research may

seek to measure and differentiate various types of social-cognitive processes in order to examine how they relate to attachment organization and friendship competence during adolescence. This work may additionally inform our growing understanding of how and why faulty social-information processing may arise. Lastly, as with the arousal findings, the results presented here represent only a handful of findings within an ambitious plan of analyses examining the inter-relationships between primacy and arousal, attachment and friendship competence – the fact that these results may be an effect of statistical chance (Type I error) cannot be disregarded.

As with the analyses for arousal, post hoc analyses were conducted to explore the possibility that primacy may be predicted curvilinearly by the deactivation-hyperactivation continuum, with the most secure teens demonstrating the least primacy. Direct relationships between primacy and attachment organization, de/hyperactivation of the attachment system, and friendship competence also were explored separately for each of the three attachment categories (i.e., dismissing, secure, and preoccupied). Additionally, the primacy scale was divided into primacy for positively begun items and primacy for negatively begun items, in order to explore the possibility that primacy might be stronger if potential threat were perceived first (i.e., primacy might be stronger for negatively begun items). Only one statistically reliable result was revealed, indicating that hyperactivating teens may be more inclined to pay more attention to positive information when it is presented first. However, since this post hoc finding was isolated and not particularly robust, it was generally not thought to bolster the validity of the primary analyses.

A factor contributing to the lack of findings also may exist in the construction of the primacy measure. Although other studies have used similar measures of cognitive flexibility, the vignettes of hypothetical peers may not be sufficiently compelling to be robustly affected by activation of the attachment system via interview – teens may not have found the interpersonal vignettes sufficiently "threatening" as to activate attachment-related cognitive schemata. A more naturalistic measure of social-cognitive flexibility, such as observations of adolescents problem solving with their closest friends, may prove more effective. Eventually, such data will be available from the larger NIMH-sponsored study from which this project was drawn, but, at this time, those data are not available.

The internal consistency of the primacy measure also is questionable. The Cronbach's alpha was small and negative, suggesting that the social-cognitive flexibility measure does not coherently assess one construct. Since the purpose of the scale total was to assess the degree to which teens demonstrated primacy, which is a construct superimposed on dimensions of sociability, this is not totally unexpected (as items reflecting high and low sociability were both loaded positively together onto the primacy scale). However, studying one sociability dimension, or reconceptualizing primacy using some version of a computerized, Stroop paradigm, might prove more fruitful. Further research may find using *in vivo* problem solving tasks and/or computerized paradigms assessing subconscious pairing of characteristics of close friends and fear of interpersonal threat, more robust predictors of attachment organization.

Overall, further research is needed to elucidate a social-cognitive mechanism of attachment organization and it's potential impact on the development of friendship competence during adolescence. Evidence that primacy may be associated with hyperactivation of the attachment system and that recency may be associated with deactivation of the attachment system is both intuitive and supported by theory – if not directly by existing self-report-based research. However, the lack of links with friendship competence is unexpected and perplexing. There has been extensive research supporting cognitive underpinnings of attachment organization in children, and as relationships expand and intensify during adolescence, understanding social-cognition during this developmental period is particularly important.

Conclusions from Follow-up Analyses

As noted in the Results section, there were three additional factors thought to potentially affect results from this project. Whereas the length of time between teens' first visit to the lab and when they were administered the AAI did not impact results from these studies, half of the results were affected by covarying minority status and family income. While there was no clear pattern to these results, they support the importance of incorporating knowledge about economic stress and cultural perspectives when understanding attachment. A more ecologically valid measure of economic stress and cultural perspectives on child rearing may be illuminating. Additionally, refinement of the arousal and social-cognitive flexibility measures (as described above), would be necessary before the impact of economic stress and cultural perspectives on arousal and social-cognitive flexibility could be fully evaluated.

These follow-up analyses also suggest that primacy may not have a predictable relationship with measures of attachment for teens who report having experienced trauma and/or loss. In the Strange Situation paradigm, disorganized/disoriented infants are classified as such if they exhibit disorganized (e.g., approaching parent with head averted) or disoriented behaviors (e.g., still/freezing for many seconds, rocking). Similarly, the current findings may indicate that adolescents who even report experiencing trauma/loss are processing social situations more randomly – neither with more attention to the first nor last bits of information presented (this is consistent with observations of preschool children acting out-of-sync when playing with peers, Jacobvitz & Hazen, 1999). However, there is no indication regarding whether or not these adolescents are actually "unresolved." Since disorganization is relatively rare, studies using high-risk samples of teens may illuminate the cognitive processing of this clinically important group.

Limitations of the Studies

The project presented has several design limitations. First, while a community sample of adolescents is most reflective of the general population, it may not be the best sample for exploring aspects of insecure attachment (as the incidence of preoccupied adolescents is low). Second, the instruments used to measure attachment-related affective arousal and social-cognitive flexibility are novel, designed specifically for this project. Whereas they were based on validated measures of similar constructs, the results presented here should be interpreted cautiously until such a time that these specific measures are validated through further research. Third, whereas formal operational

thought is expected to start developing by the age of 12 (Piaget, 1964), assessing attachment organization prior to the full rise of formal operational thought may fail to capture the full extent of adolescents ability to meta-monitor, and therefore, be cognitively flexible. If attachment organization were assessed later in adolescence, formal operational thought would more likely be achieved for all participants and working models of attachment may be more readily applied to peer relationships. Similarly, while friendships are definitely becoming more intimate and intense by age 15 (Buhrmester, 1996), friendships may not sufficiently reflect attachment relationships at this age; assessing friendship competence later in adolescence may be necessary. Lastly, while data were collected across a span of three years, longitudinal analyses could further illuminate our understanding of the development of friendship competence. The results presented here are essentially cross-sectional and correlational: analyses cannot be interpreted to imply direction of effects or causality. In fact, affective arousal and primacy may arise from experiences in friendships and subsequently affect revision of working models of attachment, rather than the other way around. In sum, future research could build on the findings presented here by capitalizing on a somewhat older, larger, and/or at-risk sample of adolescents such that the effects of preoccupation/hyperactivation on friendship competence would be clearer. Additionally, enhanced and/or more naturalistic measures of attachment-related affective arousal and social-cognitive flexibility may prove fruitful.

Conclusions and Implications

While not overwhelming, results from this study suggest that affective arousal, or perhaps the interpersonal expression of attachment-related affective arousal, may somewhat differentially impact boys' and girls' friendships, and that insecure teens may fail to use all available information when judging new people. These studies provide modest, albeit theoretically viable, evidence for affect management and social-cognitive flexibility mechanisms of attachment organization. Future research must improve upon the measurement and sample limitations of this project.

Continued understanding of the mechanisms responsible for the application of working models of attachment with parents to competence in peer relationships could inform interventions with disordered youth. To the extent that developmental differences exist between adolescent boys and girls in how, when, and why working models are revised, individual and group psychotherapies could be targeted to specific affective or cognitive deficits affecting social relationships. Since the quality of adolescents' peer relationships is highly associated with their overall functioning, such interventions could have substantial impact.

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Table 1. *Family Income (Parent Report, Wave 1)*

Gross Income Range per Year	N
< $5,000	6
$5,000 - $9,999	4
$10,000 - $14,999	6
$15,000 - $19,999	6
$20,000 - $29,999	27
$30,000 - $39,999	14
$40,000 - $59,999	36
≥ $60,000	46

Note. 2 missing.

Table 2. *Correlations Between Primary Variables*

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
1. Security of Attachment	1.00												
2. Deactivation of Attachment	-.76	1.00											
3. Idealization of Attachment Figures	-.86	.83	1.00										
4. Insistence Upon Lack of Recall	-.85	.89	.86	1.00									
5. Derogation of Attachment Figures	-.83	.86	.74	.77	1.00								
6. Involved Anger with Attachment Figures	-.17	-.31	-.10	-.17	-.08	1.00							
7. Passivity of Thought with Regard to Attachment	-.54	.02	.36	.20	.20	.65	1.00						
8. Attachment-related Anxious Arousal	.02	-.15	-.02	-.04	-.15	.16	.13	1.00					
9. Attachment-related Angry Arousal	.08	-.15	-.12	-.07	-.13	.00	.02	.50	1.00				
10. Primacy	.17	-.21	-.26	-.22	-.16	.20	.00	.11	.13	1.00			
11. Close Friend-Reported Teen Friendship Competence	.19	-.24	-.16	-.20	-.21	-.01	.03	.01	.06	.12	1.00		

Table 2, continued. *Correlations Between Primary Variables*

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
12. Teen Self-Reported Teen Friendship Competence	.08	.00	-.07	.00	-.06	-.14	-.15	.05	.11	.17	.80	1.00	
13. Observed Friendship Competence	.24	-.26	-.30	-.31	-.19	.06	.02	.07	.01	.12	.21	.20	1.00
Means	0.26	0.15	5.07	4.59	4.41	4.53	4.45	0.03	0.49	7.22	373.25	205.37	1.71
Standard Deviations	0.41	0.27	1.46	1.96	1.22	0.87	1.13	1.56	1.90	1.06	59.18	85.62	0.50
N	147	147	147	147	147	147	147	147	147	147	131	147	133

Table 3. *Predicting Deactivation of Attachment Figures (AAI)*

	β	R^2	ΔR^2
1. Gender (1=male, 2= female)	$-.30^{***}$	$.9^{***}$	
2. Attachment-related Anxious Arousal	$-.13^{+}$	$.11^{***}$	.02
3. Gender * Anxious Arousal	$.20^{*}$	$.14^{***}$	.03

Note. β's are from entry into the model. N = 147.

$^{+}$ p ≤ .10, * p ≤ .05, ** p ≤ .01, *** p ≤ .001

Table 4. *Predicting Security of Attachment (AAI)*

	β	R^2	ΔR^2
1. Gender	.11	.01	
(1=male, 2= female)			
2. Primacy	.17*	.04*	.03

Note. β's are from entry into the model. N = 147.

$^{+}$ p ≤ .10, * p ≤ .05, ** p ≤ .01, *** p ≤ .001

Table 5. *Predicting Deactivation of Attachment (AAI)*

	β	R^2	ΔR^2
1. Gender	-.30***	.09***	
(1=male, 2= female)			
2. Primacy	-.21**	.14***	.05

Note. β's are from entry into the model. N = 147.

$^{+}$ $p \leq .10$, * $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$

Table 6. *Predicting Idealization of Attachment Figures (AAI)*

	β	R^2	ΔR^2
1. Gender	$-.15^{+}$	$.02^{+}$	
(1=male, 2= female)			
2. Primacy	$-.26^{***}$	$.09^{***}$	.07

Note. β's are from entry into the model. N = 147.

$^{+}$ p ≤ .10, * p ≤ .05, ** p ≤ .01, *** p ≤ .001

Table 7. *Predicting Insistence Upon Lack of Recall for Attachment Experiences (AAI)*

	β	R^2	ΔR^2
1. Gender	-.23**	.05**	
(1=male, 2= female)			
2. Primacy	-.22**	.10***	.05

Note. β's are from entry into the model. N = 147.

$^{+}$ $p \leq .10$, * $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$

Table 8. *Predicting Derogation of Attachment Figures (AAI)*

	β	R^2	ΔR^2
1. Gender	-.26***	.07***	
(1=male, 2= female)			
2. Primacy	-.16*	.10***	.03

Note. β's are from entry into the model. N = 147.

$^{+}$ $p \leq .10$, * $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$

Table 9. *Predicting Involved Anger with Attachment Figures (AAI)*

	β	R^2	ΔR^2
1. Gender	.21**	.04**	
(1=male, 2= female)			
2. Primacy	.20**	.08***	.04

Note. β's are from entry into the model. N = 147.

$^{+}$ p ≤ .10, * p ≤ .05, ** p ≤ .01, *** p ≤ .001

Table 10. *Mean Deactivation Scores by Attachment Category*

Attachment Category	N	M (SD) for Deactivation
Dismissing	50	.47 (.11)
Secure	86	.00 (.15)
Preoccupied	10	.09 (.16)

Table 11. *Mean Primacy Scores by Attachment Category*

Attachment Category	N	M (SD) for Primacy
Dismissing	50	6.98 (1.08)
Secure	86	7.04 (1.05)
Preoccupied	10	7.33 (.86)

Table 12. *Predicting Close Friend-Reported Teen Friendship Competence, Wave 3*

	β	R^2	ΔR^2
1. Gender	.31***	.10***	
(1=male, 2= female)			
2. Attachment-related Anxious Arousal	.01	.10***	.00
3. Gender * Anxious Arousal	-.28**	.15***	.05

Note. β's are from entry into the model. N = 131.

$^{+}$ p ≤ .10, * p ≤ .05, ** p ≤ .01, *** p ≤ .001

Table 13. *Predicting Close Friend-Reported Teen Friendship Competence, Wave 3*

	β	R^2	ΔR^2
1. Gender	.31***	.10***	
(1=male, 2= female)			
2. Attachment-related Angry Arousal	.06	.10***	.00
3. Involved Anger with Attachment	-.07	.11**	.01
Figures (AAI)			
4. Angry Arousal * Involved Anger	-.07	.11**	.00
5. Gender * Angry Arousal	-.12		
Gender * Involved Anger	-.05	.12**	.00
6. Gender * Angry Arousal * Involved	.24*	.16**	.04
Anger			

Note. β's are from entry into the model. N = 131.

$^{+}$ p ≤ .10, * p ≤ .05, ** p ≤ .01, *** p ≤ .001

Figure 1. *Interaction between Gender and Attachment-Related Anxious Arousal*

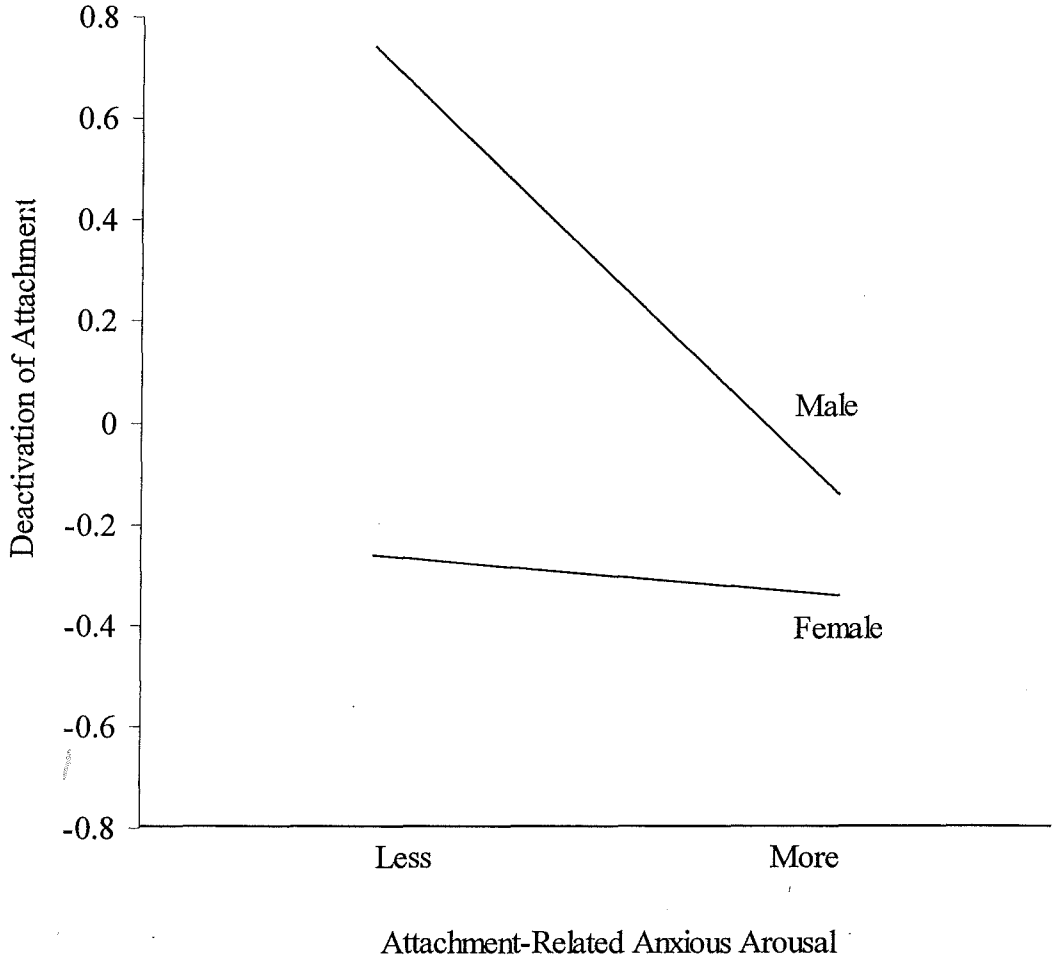


Figure 2. *Interaction between Gender and Attachment-Related Anxious Arousal*

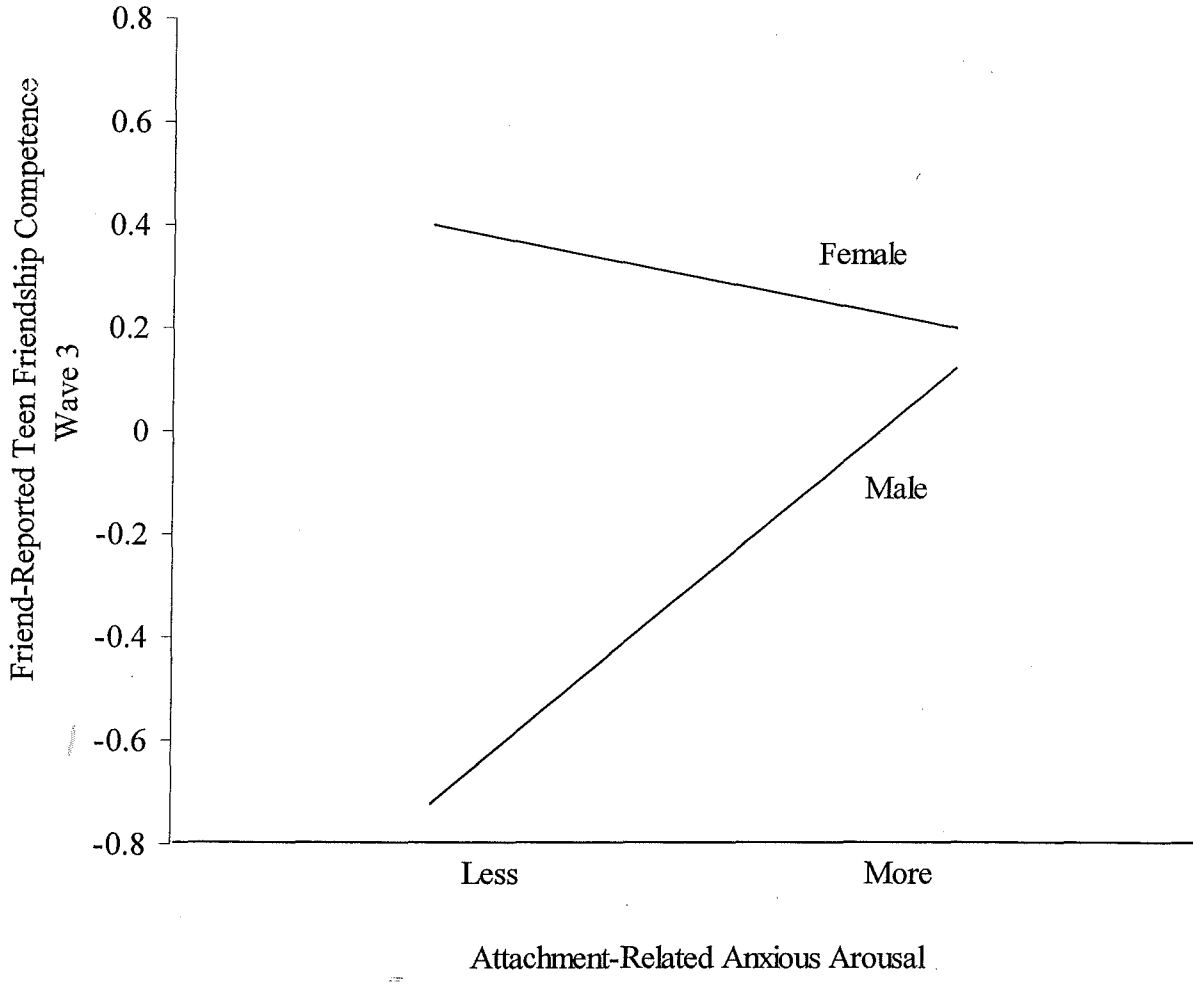


Figure 3. *Interaction between Gender, Attachment-Related Angry Arousal, and Involved Anger with Attachment Figures*

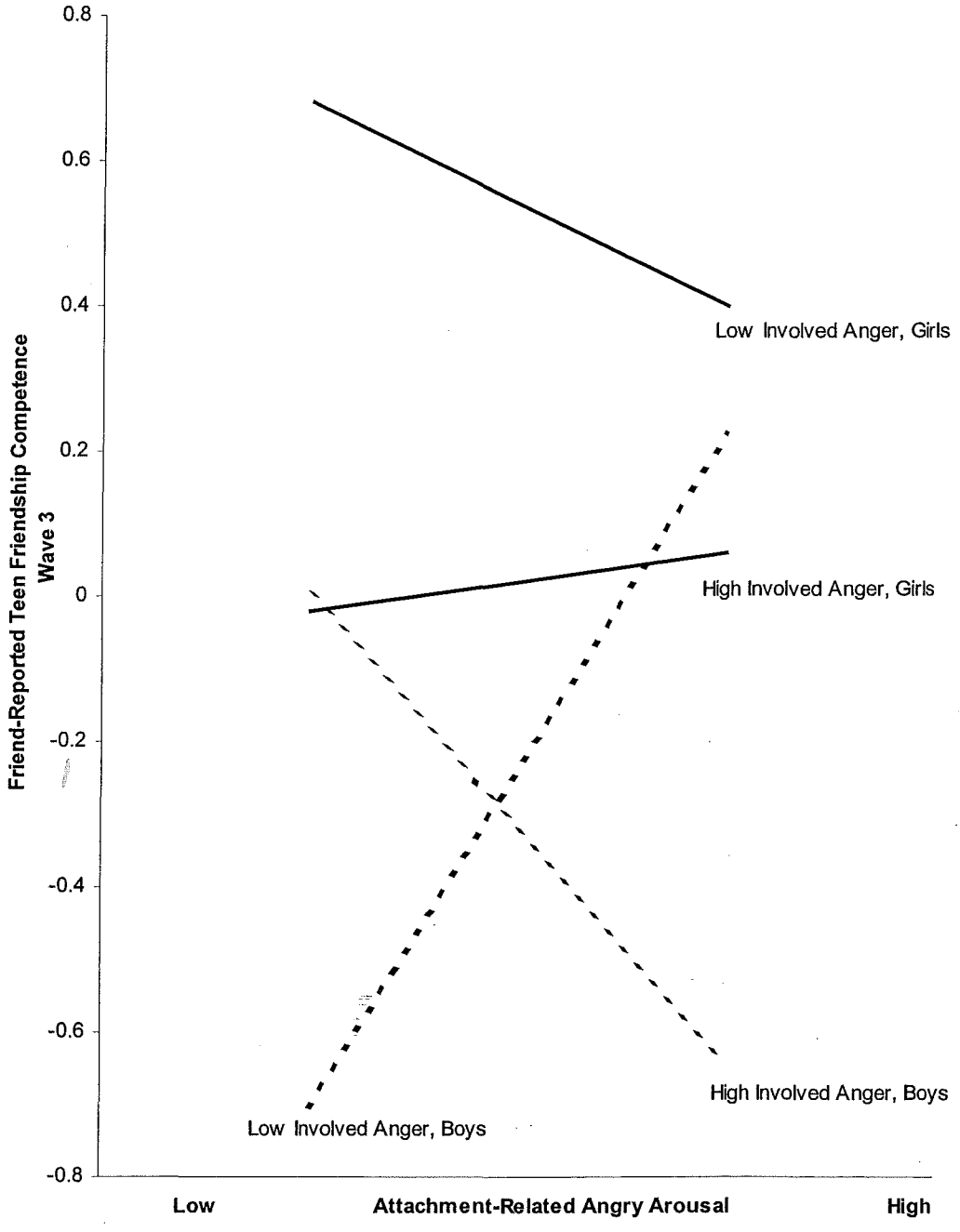


Figure 4. *Curvilinear relationship between deactivation-hyperactivation and angry arousal*

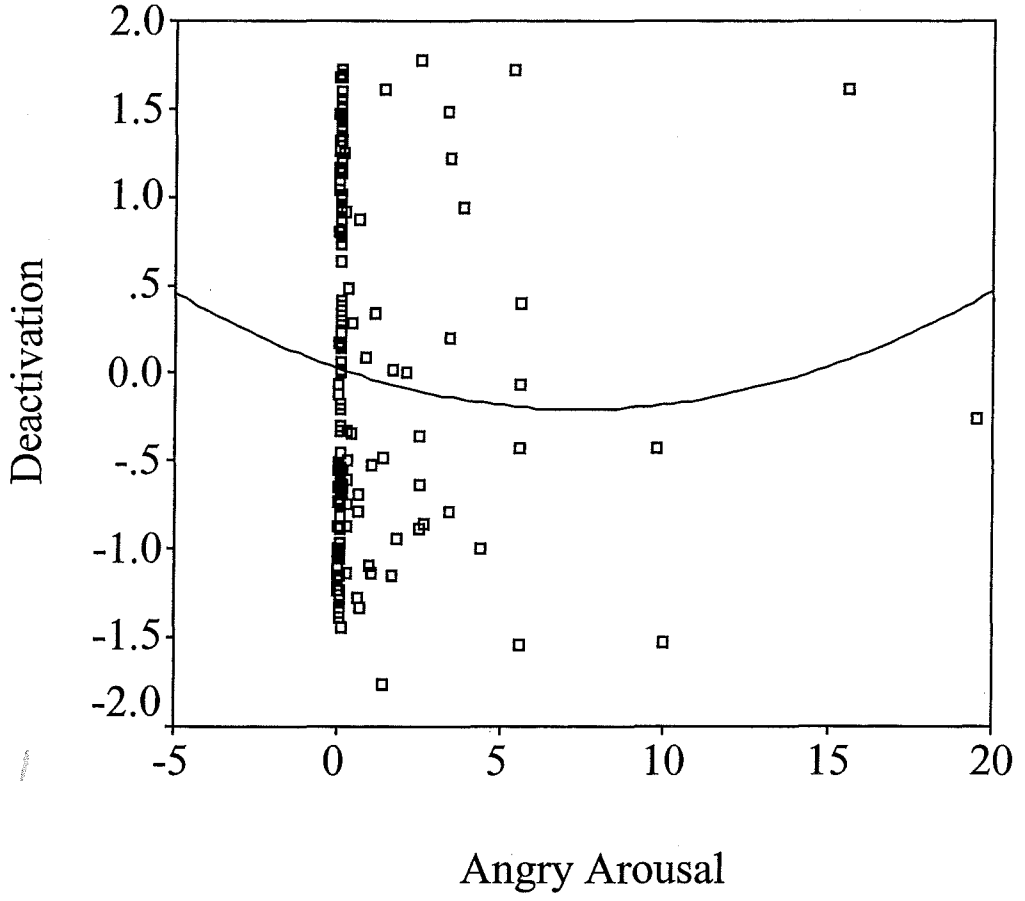


Figure 5. *Curvilinear relationship between observed friendship competence and anxious arousal*

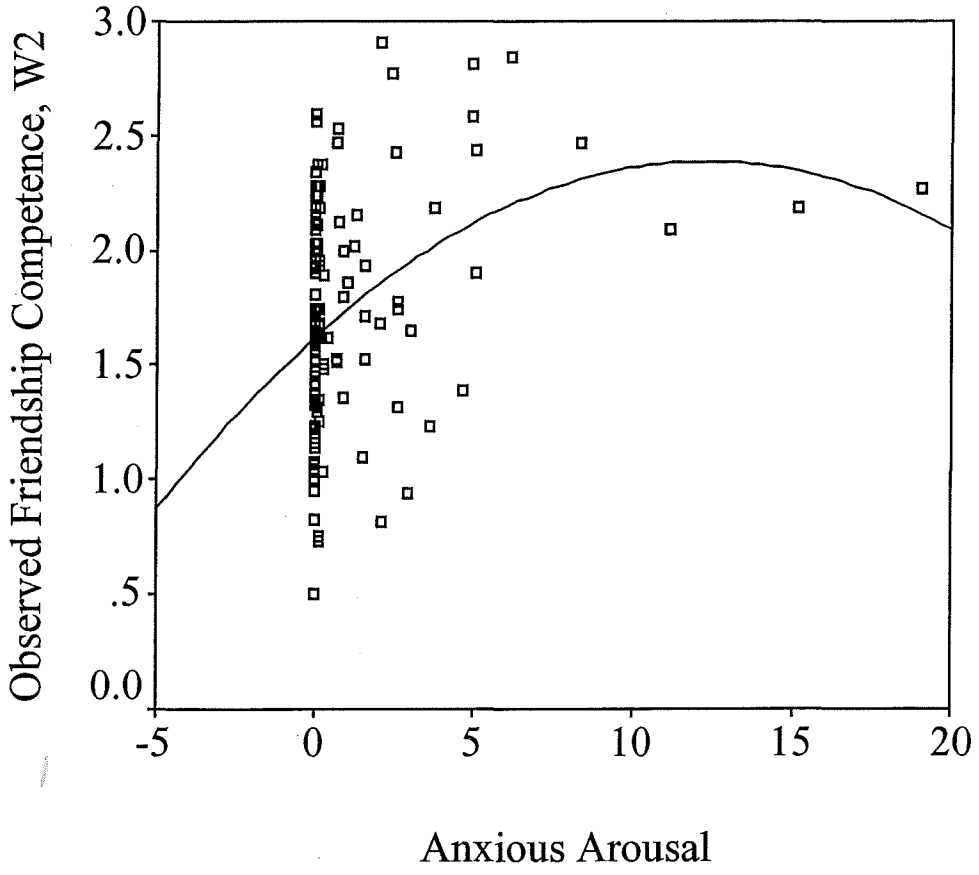


Figure 6. *Interaction between Trauma/Loss, Primacy, and Security of Attachment*

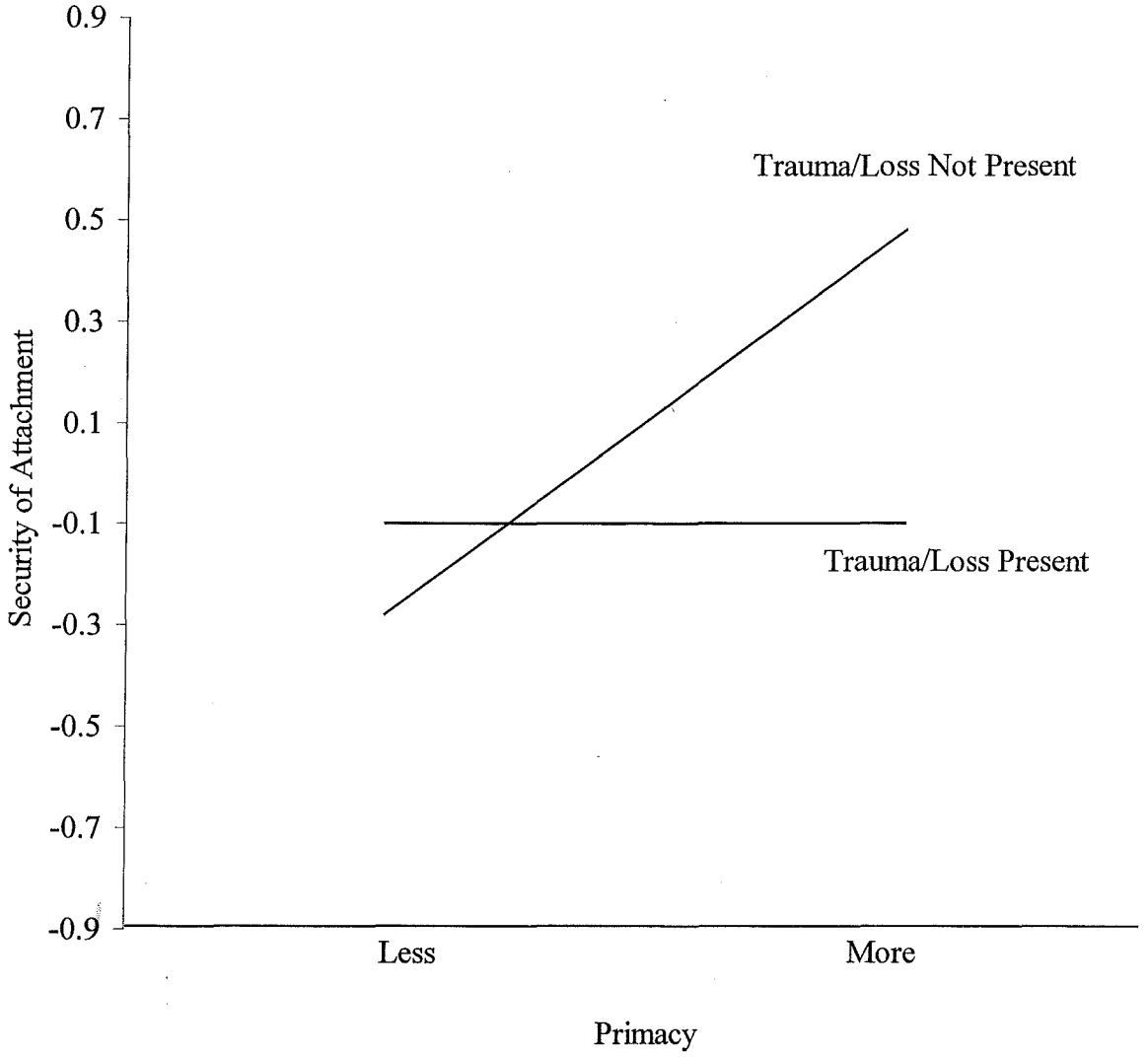
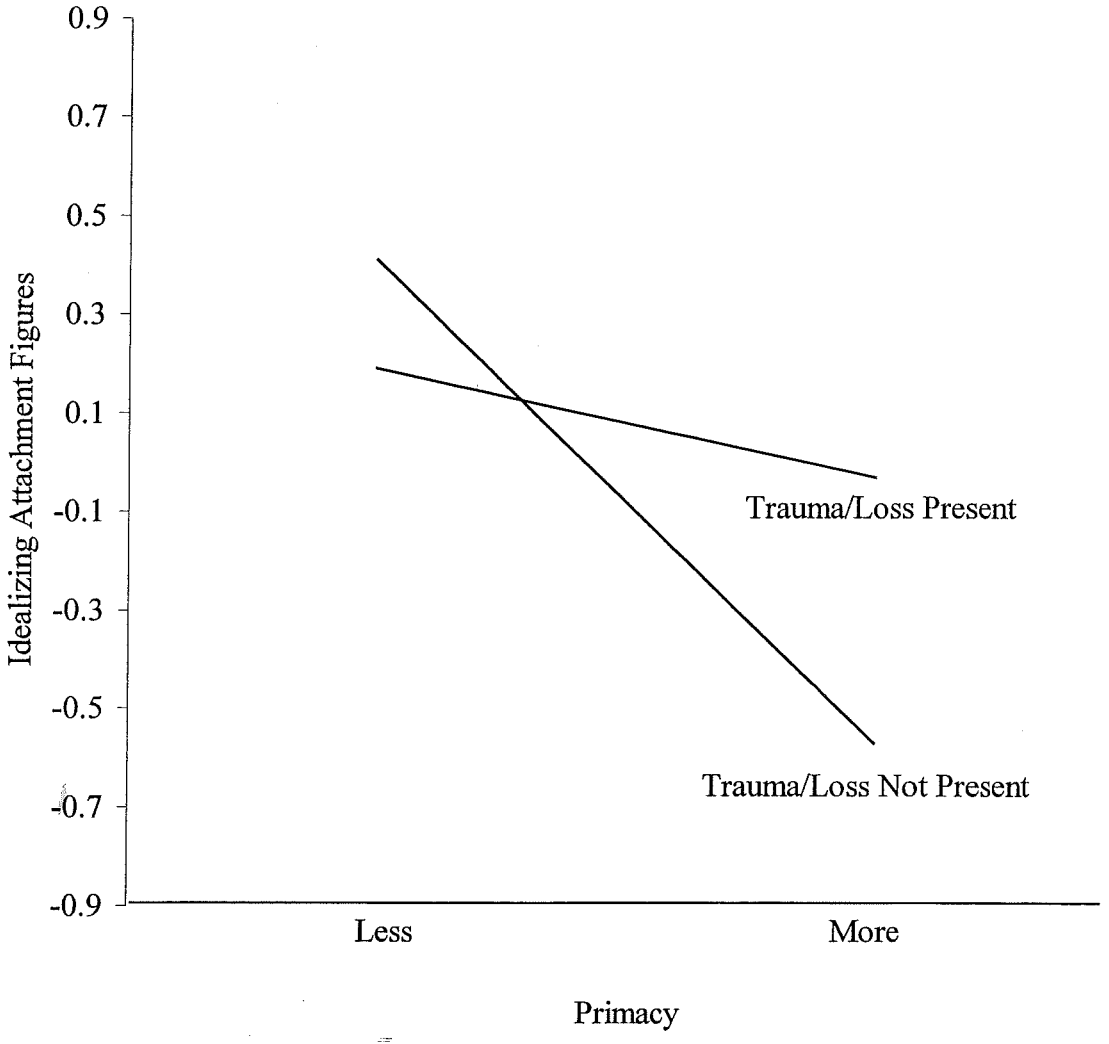


Figure 7. *Interaction between Trauma/Loss, Primacy, and Idealization of Attachment Figures*



Appendix A

Categorization of Attachment Throughout the Lifespan

Infant Attachment *Assessed via Strange Situation* 0 through 18 months of age	**Preschool Attachment** *Assessed via various methods* Validity data through age 7	**Adult Attachment** *Assessed via Interview* Approximately age 14 on
Secure	Secure	Autonomous (Free)/Secure
Avoidant	Avoidant	Dismissing
Resistant/Ambivalent	Ambivalent/Dependent	Preoccupied (Entangled)
Disorganized/Disoriented	Disorganized/Controlling	Unresolved/Disorganized

Thank you to Lina L. Robinson, at the Attachment Clinic, for compiling this table (October, 2001).

Appendix B

States of Mind Regarding Attachment Scales Derived from Q-Sort Cards

Idealizing	**Lack of Recall**	**Derogation**	**Involved Anger**	**Passivity**
93: Depicts parents as perfect or wonderful without convincing reader	46: Subject persistently does not remember	89: Belittles or derogates parents (anger heightens involvement)	92: Is caught up with analyzing parental shortcomings	75: Loses topic during interview, failing to complete thoughts
84: (R) Is credibly and easy to believe (presents information that is hard to believe)	19: Responses are superficial and require further probes	39: (R) Subject values attachment (subject devalues attachment relationships)	54: Is currently angry towards parents	55: Is confused and overwhelmed
1: Parental descriptions are stereotyped	47: Is guarded or threatened by interview questions	71 (R) Relies on others in a frustrated or dissatisfied way (demeans or plays down need to rely on others)	36: (R) Understands parents' limitations in light of their own experiences (blaming)	8: (R) Responses maintain focus (responses include sudden intrusions or shifts)
56: Parental shortcomings are implied but not directly acknowledged	10: (R) Subject recalls specific childhood memories of distress (subject avoids recalling distressing events)	61: Presents self as invulnerable	30: Responds in excessive detail about attachment relationships	48: Vacillates between positive & negative
11: (R) Parental faults or limitations are depicted directly (negative aspects emerge indirectly)		57: Is detached and uninfluenced by childhood experiences	45: Is currently preoccupied with negative experiences with parents	
64: (R) Acknowledges setbacks that have been overcome (denies any setbacks, negative effects or hurt)		35: Is stoic about comfort or support		

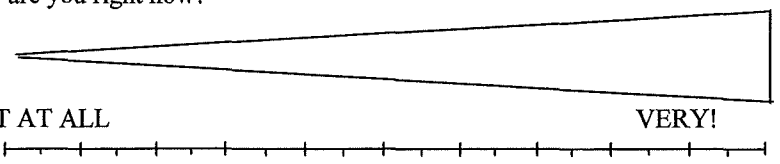
The number indicates the Q-Sort card number; (R) indicates the card's score was reversed in calculating the scale.

Appendix C

Affective Arousal Scale

The following list of words describes ways people may sometimes feel. Please think about how you feel **RIGHT NOW**, right this very minute. Make a slash on the line that shows how much you feel each thing right now. Let's practice one.

How **hungry** are you right now?



*Remember, mark how you feel **RIGHT NOW**.*

1. How **happy** do you feel right now?

NOT AT ALL VERY!

2. How **sad** do you feel right now?

NOT AT ALL VERY!

3. How **worried** do you feel right now?

NOT AT ALL VERY!

4. How **excited** do you feel right now?

NOT AT ALL VERY!

5. How **angry** do you feel right now?

NOT AT ALL VERY!

6. How **cheerful** do you feel right now?

NOT AT ALL VERY!

7. How **upset** do you feel right now?

NOT AT ALL VERY!

8. How **tense** do you feel right now?

NOT AT ALL VERY!

Appendix D
Cognitive Flexibility Measure

Vignettes – Girl's Version (Boy's Version is identical, but with male names/pronouns replacing female names/pronouns). The following vignettes are played to teens on audiotape.

NICE Positive-Negative Number One. Leslie notices that you don't have a pencil to take the math quiz with and lends you one of hers. She's always saving you, yesterday in Science she lent you some paper when your forgot notebook. After the math quiz, the class breaks up into small groups to do a project. You notice that Leslie is using your big eraser again without asking. You're kind of mad because she is always borrowing your stuff without asking. Like last week she just borrowed your Math book without asking.

HONEST Negative-Positive Number Two. You and your friend Terri are eating lunch at school. She is saying how Saturday she was at the mall, and the sales lady accidentally gave her an extra $10 in change. She says she noticed the mistake and but kept the money anyway. Then she says a similar thing happened last week where the sales person at the movies forgot to charge her for her ticket. She says was pretty excited that she got to see the movie for free. Just then the bell rings. On your way to class you pass some people who are saying that Terri found a wallet with $20 in it and turned it to the school office with the money. You remember that last month you and Terri also found a really cool watch in the locker room and she put up a sign so she could return it to the person who lost it

FRIENDLY Positive-Negative Number Three. You think this girl Gina is pretty cool. You are kind of excited because in 4th period she invited you to a party she's having this weekend. Plus, a couple of weeks ago she also asked you to hang out at the mall. After school you see Gina getting her books out of her locker. You say "hi," but she ignores you. You don't know what's up with her. She went to sit next to some other people at lunch today and didn't ask you to join them.

GENEROUS Negative-Positive Number Four. Yesterday was your friend's birthday and you forgot. Your other friend Jenny brought a present and offers to put your name on it too. The other day she helped you too. You were having trouble with your Social Studies homework and she took the time to help you figure it out. Suddenly you realize that you forgot money for lunch. You ask Jenny if you can borrow $5 because you know she just got her allowance. But, she says "No." She can be like that. Two nights ago you called her to talk about a problem you were having but she said she was just too busy to listen to you and that you should call someone else.

Appendix D, continued (2 of 4)

HONEST Positive-Negative Number Five. You and your friend Keisha are at the park. You notice that a man drops a $20 out of his pocket. Keisha picks up the money and runs after him to give it back. Later, as you are walking to her house, you find a bracelet on the ground. Keisha remembers that it belongs to the lady across the street and asks if you mind stopping by with her to return it. When you get to Keisha's house, you are hanging out in her room. You notice that she has a new CD from this really hot band. When you ask how she afforded it, she said she accidentally walked out of the music store with it and decided to just keep it.. You remember that last month, she snuck into the movies about four times.

FRIENDLY Negative-Positive Number Six. On your way to lunch, you pass by your friend Marguerite who is talking to a group of people about this other girl you know. Marguerite is saying that sometimes this girl can be a real jerk. Marguerite can be really hard to get along with; you've heard her sometimes say some other rude things about people too. You go to get your lunch and on the way to sit down you pass Marguerite again. She is saying that it's too bad that Patrice is absent today because she just really likes her. Marguerite always wants to include everyone in what she does; in fact, last week she went out of her way to invite you to a party she was having.

GENEROUS Positive-Negative Number Seven. Your friend Darla comes up to you at lunch. She says that she remembered that you said you liked this CD and since she happened to have two of them, she thought you'd like one. Last month she got some birthday money and took you and another friend to lunch. After school, you meet her in the library to study and you are starving. Darla grabs a big bag of chips from her book bag. You ask if you can have a couple, but she says "No" because she's hungry. Yesterday, she was like that too. She wouldn't lend you her a pen to take a test with because she was afraid you would lose it or not give it back.

NICE Negative-Positive Number Eight. When you're at the music store with your friend Jessica, you pick out a CD by a new band that you really like and ask if she likes this band too. She says that anyone who likes that band is really dumb. She also says that you just have terrible opinions about music and that you really should get with it. You finally find a CD you want to buy, but when you are getting rung up, you realize that you are $5 short. Jessica says "Don't worry about it, I have $5 you can borrow." She's always lending you stuff when you need it. Like last week she did that too. She lent you her Math book when you lost yours and had to get your homework in.

Appendix D, continued (3 of 4)

The teens are presented the following instructions on audiotape.

Please DON'T turn the pages of this questionnaire until you are instructed to.
I'm going to play you some short stories that we recorded. I'd like you to pretend that each of these stories is happening to you. After each story, you will be asked to turn the page and to please rate how you feel about that person in the story. Listen carefully because I can only play them once.

Each of the following are presented on a separate page:

1. How **nice** is Leslie?

Leslie is *very* not nice.	Leslie is *somewhat* not nice.	Leslie is *a little bit* not nice.	Leslie is *neither* not nice nor nice.	Leslie is *a little bit* nice.	Leslie is *somewhat* nice.	Leslie is *very* nice.
1	**2**	**3**	**4**	**5**	**6**	**7**

2. How **honest** is Terri?

Terri is *very* dishonest.	Terri is *somewhat* dishonest.	Terri is *a little bit* dishonest.	Terri is *neither* dishonest nor honest.	Terri is *a little bit* honest.	Terri is *somewhat* honest.	Terri is *very* honest.
1	**2**	**3**	**4**	**5**	**6**	**7**

3. How **friendly** is Gina?

Gina is *very* unfriendly.	Gina is *somewhat* unfriendly.	Gina is *a little bit* dishonest.	Gina is *neither* unfriendly nor friendly.	Gina is *a little bit* friendly.	Gina is *somewhat* friendly.	Gina is *very* friendly.
1	**2**	**3**	**4**	**5**	**6**	**7**

4. How **generous** is Jenny?

Jenny is *very* selfish.	Jenny is *somewhat* selfish.	Jenny is *a little bit* selfish.	Jenny is *neither* selfish nor generous.	Jenny is *a little bit* generous.	Jenny is *somewhat* generous.	Jenny is *very* generous.
1	**2**	**3**	**4**	**5**	**6**	**7**

5. How **honest** is Keisha?

Keisha is *very* dishonest.	Keisha is *somewhat* dishonest.	Keisha is *a little bit* dishonest.	Keisha is *neither* dishonest nor honest.	Keisha is *a little bit* honest.	Keisha is *somewhat* honest.	Keisha is *very* honest.
1	**2**	**3**	**4**	**5**	**6**	**7**

6. How **friendly** is Marguerite?

Marguerite is *very* unfriendly.	Marguerite is *somewhat* unfriendly.	Marguerite is *a little bit* dishonest.	Marguerite is *neither* unfriendly nor friendly.	Marguerite is *a little bit* friendly.	Marguerite is *somewhat* friendly.	Marguerite is *very* friendly.
1	**2**	**3**	**4**	**5**	**6**	**7**

Appendix D, continued (4 of 4)

7. How **generous** is Darla?

Darla is *very* selfish.	Darla is *somewhat* selfish.	Darla is *a little bit* selfish.	Darla is *neither* selfish nor generous.	Darla is *a little bit* generous.	Darla is *somewhat* generous.	Darla is *very* generous.
1	**2**	**3**	**4**	**5**	**6**	**7**

9. How **nice** is Jessica?

Jessica is *very* not nice.	Jessica is *somewhat* not nice.	Jessica is *a little bit* not nice.	Jessica is *neither* not nice nor nice.	Jessica is *a little bit* nice.	Jessica is *somewhat* nice.	Jessica is *very* nice.
1	**2**	**3**	**4**	**5**	**6**	**7**