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Infants' Attachment Insecurity Predicts Attachment-Relevant Emotion Regulation Strategies in Adulthood

Yuthika U. Girme,
Simon Fraser University

Rachael E. Jones,
University of Minnesota

Cory Fleck,
University of Minnesota

Jeffry A. Simpson,
University of Minnesota

Nickola C. Overall
University of Auckland

Abstract

Infant attachment is theorized to lay the foundation of emotion regulation across the life span. However, testing this proposition requires prospective designs examining whether attachment assessed in infancy predicts emotion regulation strategies observed in adult relationships. Using unique data from the Minnesota Longitudinal Study of Risk and Adaptation, we examined whether infant attachment assessed at 12 and 18 months in the Strange Situation were associated with attachment-relevant emotion regulation strategies coded from video-recorded conflict discussions with romantic partners at ages 20, 23, 26, and/or 35. The current research first integrated the developmental and emotion regulation literatures to identify three specific *attachment-relevant* emotion regulation strategies. *Balanced-regulation* involves being open, approach-orientated, and engaging in collaborative problem-solving. *Hypo-regulation* involves suppressing emotions, disengaging from close others, and engaging in superficial problem-solving. *Hyper-regulation* involves exaggerating emotional expressions, ruminating, and being self-focused in processing issues. Compared to *stable secure infants* (secure at 12 and 18 months), *stable insecure infants* (insecure at 12 and 18 months) displayed worse balanced-regulation and greater hypo-regulation strategies, and *unstable insecure infants* (insecure at 12 or 18 months) displayed greater hyper-regulation strategies, in relationship-threatening situations 20–35 years later. Conceptually replicating these results, greater friendship insecurity at age 16 predicted worse balanced-regulation and greater hypo- and hyper-regulation strategies during relationship-threatening situations in adulthood. These findings highlight that infant attachment insecurity is associated with distinct emotion regulation strategies in adulthood 20–35 years later.

Keywords

attachment insecurity; emotion regulation; infant attachment

Does infant attachment provide the foundation for emotion regulation behavior in adulthood? Attachment theory postulates that early life experiences with caregivers shape the way people will regulate their emotion in threatening situations in adulthood (Bowlby, 1973; Bretherton & Mulholland, 2008; Cassidy, 1994; Main, 1990; Marvin, Britner & Russell, 2016). Despite the major influence of attachment theory in understanding adult social behavior, no prior research has established whether infant attachment prospectively predicts *theoretically relevant* patterns of emotion regulation in adulthood. This is a significant gap in our knowledge given that better emotion regulation is crucial for wellbeing (Aldao, Nolen-Hoeksema, & Schweizer, 2010; Chervonsky & Hunt, 2017). In the current research, we integrate theoretical perspectives in the attachment literature (Cassidy, 1994; Main, 1990; Mikulincer, Shaver & Pereg, 2003) with evidence from the developmental and emotion regulation literatures (Naragon-Gainey, McMahan & Chacko, 2017; Pallini et al., 2018) to identify attachment-relevant emotion regulation strategies (see Table 1). We then use existing data from a unique longitudinal study to test whether infant attachment insecurity prospectively predicts these attachment-relevant emotion regulation strategies in relationship threatening situations in adulthood 20–35 years later.

Theoretical Perspectives Linking Attachment Insecurity and Emotion Regulation Strategies

A core tenant of attachment theory is that caregivers act as a safe haven that help calm infants when distressed and act as a secure base for infants to return to safe exploration of their environment. Early theoretical perspectives have suggested that infants develop automatic and unconscious behavioral strategies in response to different types of caregiving experiences they receive (Main, 1990), and one such strategy involves how infants regulate their emotions (Cassidy, 1994; also see Cassidy & Berlin, 1994). For example, *securely attached* infants have generally received responsive care, which leads them to believe that close others will be available and responsive in future interactions (Bowlby, 1973). Secure infants are theorized to demonstrate open and flexible emotion expression that allows them to signal their needs to their caregiver freely and directly, and upon being calmed, return to play and exploration (Cassidy, 1994). In adulthood, security and trust in others' availability should result in *coregulation strategies* during times of need, which involve seeking proximity to close others and engaging in open emotional expression in order to soothe any distress and allow engagement in adaptive problem solving (see Table 1; Mikulincer et al., 2003; Shaver & Mikulincer, 2002).

Insecurely attached infants, conversely, have typically received poorer caregiving thereby fostering negative expectations of others and the self that lead them to develop different emotion regulation strategies (Bowlby, 1973; Cassidy, 1994; Main, 1990). These attachment representations and accompanying regulation strategies are reinforced across time and serve as a prototype for attachment representations in adulthood (for a meta-analytic review see

Fraley, 2002; also see Fraley, Roisman, Booth-LaForce, Owen & Holland, 2013). Most insecure infants are either: (a) avoidantly attached (anxious/avoidant) due to cold, rejecting care, or (b) anxiously attached (anxious/ambivalent) due to inconsistent care (Bowlby, 1973; Ainsworth, Blehar, Waters & Wall, 1978). In response to the caregiving they have received, infants classified as avoidant are theorized to minimize their emotion expressions because they fear that expressing emotions might lead to rejection (Cassidy, 1994). Instead, avoidant infants hide their distress to maintain proximity to caregivers and not trigger the rejection that occurs when they seek attention or care (Main & Solomon, 1986). In adulthood, attachment avoidance promotes *deactivating strategies*, which involve distancing oneself from one's attachment figure and suppressing or minimizing negative emotions in order to limit the hurt avoidant individuals anticipate from depending on close others (see Table 1; Mikulincer et al., 2003; Shaver & Mikulincer, 2002). Infants classified as anxious-ambivalent are theorized to have heightened emotion expression (Cassidy, 1994; Cassidy & Berlin, 1994) because they learn that they need to increase their bids for attention in order to draw attention from their caregivers (Main & Solomon, 1986). Similarly, in adulthood, attachment anxiety should promote *hyperactivating strategies* that involve amplifying expressions of negative emotions and dependence on close others in order to re-establish and maintain attention and care (see Table 1; Mikulincer et al., 2003; Shaver & Mikulincer, 2002).

Notably, the developmental and emotion regulation literatures have also identified several emotion regulation strategies commonly used in adolescence and adulthood (Pallini et al., 2018). In fact, as summarized in Table 1, a recent meta-analysis indicates that these emotion regulation strategies load onto three factors that align very closely with the three emotion regulation strategies identified in the attachment literature (Naragon-Gainey et al., 2017). Specifically, *adaptive engagement* (similar to the coregulation strategy) involves problem-solving and behaviors that include reappraising negative events/outcomes. *Disengagement* (similar to the deactivating strategy) involves attempting to avoid or focus away from an emotionally-relevant situation by using distraction, expressive suppression, or disengagement to minimize negative feelings. *Aversive cognitive perseveration* (similar to the hyperactivating strategy) involves over-engagement with or rumination of negative thoughts and feelings.

Empirical Support Linking Attachment Insecurity and Emotion Regulation Strategies

Both the attachment and emotion regulation literatures highlight three key patterns of emotion regulation that should distinguish secure and insecure individuals. No research to date, however, has examined whether being securely versus insecurely attached early in life is prospectively related to these *specific* attachment-relevant emotion regulation strategies displayed in adult romantic relationships. This is in part because longitudinal attachment studies may not have been designed with these a-priori hypotheses in mind (Dozier, Manni & Lindhiem, 2005), and so prior research has predominately focused on broad (rather than specific) indicators of emotion regulation strategies later in life (Dagan & Sagi-Schwartz, 2018). What is clear from existing work is that attachment insecurity is associated with

worse emotion regulation more generally. Recent meta-analytic reviews in the developmental literature have shown that infants rated as more insecure (compared to secure) tend to have worse effortful control (Pallini et al., 2018) and worse emotion regulation/coping strategies (Zimmer-Gembeck et al., 2017) during early childhood and adolescence. Furthermore, compared to secure infants, insecure infants experience greater negative affect, are less able to regulate their emotions, engage in maladaptive cognitive coping strategies, and avoid turning to others for support during childhood and adolescence (Cooke, Kochendorfer, Stuart-Parrigon, Koehn & Kerns, 2019).

The link between insecure attachment and maladaptive emotion regulation is also corroborated by cross-sectional work examining attachment insecurity in romantic relationships. Adults who are securely attached to romantic partners seek proximity to their partners when distressed, reappraise negative situations more constructively, and exhibit greater resilience in distressing situations (Karreman & Vingerhoets, 2012; Simpson, Rholes & Nelligan, 1992). In contrast, adults who are insecurely attached to romantic partners enact more maladaptive strategies. For example, highly avoidant individuals suppress their emotional reactions, thoughts, and feelings, whereas highly anxious individuals fixate on their emotional experiences and exaggerate hurt feelings to increase their partners' care and attention (Low, Overall, Cross & Henderson, 2018; Overall, Girme, Lemay & Hammond, 2014; Overall, Simpson & Struthers, 2013). Furthermore, highly anxious or highly avoidant individuals are less able to be open about their thoughts and feelings or express their emotions in a constructive manner (Low et al., 2018).

Unique longitudinal evidence also demonstrates that infant attachment insecurity can lead to over engagement with negative emotions in childhood, which can interfere with effective emotion regulation and relationship functioning in adulthood. For example, the London Parent-Child Project provides evidence that children who are insecurely attached to their mothers are less likely to acknowledge their distress or discuss adaptive coping strategies at age 11, and children who are insecurely attached to their fathers have difficulty resolving conflicts with siblings and friends at age 11 (Steele & Steele, 2005). The Bielefeld and Regensburg studies have also demonstrated that infants' attachment security to their mothers and fathers predict whether children and adolescence are able to regulate emotions and openly turn to others for help during challenging situations (Grossmann, Grossmann & Kindler, 2005). Data from the Minnesota Longitudinal Study of Risk and Adaptation has already provided evidence that infants who were rated insecurely attached more often demonstrate worse relationship quality as observed during couples' conflict and collaboration tasks (Roisman, Sroufe, Collins & Egeland, 2005), display greater intensity of negative emotions during couples' conflict discussions (Simpson, Collins, Tran & Haydon, 2007), and find it more difficult to recover following couples' conflict discussions (Salavatore, Kuo, Steele, Simpson & Collins, 2011).

Taken together, although research across the adult attachment and developmental literatures provide evidence that attachment insecurity is associated with poorer emotion regulation in general, these studies do not reveal how infant attachment is associated with specific *attachment-relevant* emotion regulation strategies in adulthood (balanced-, hypo-, or hyper-regulation strategies). This distinction is important because while infant attachment

insecurity should be related to less constructive emotion regulation in general, these types of associations may also be predicted by non-attachment processes (Dozier et al., 2005). Thus, it is important to illustrate whether individuals adopt *specific* emotion regulation strategies that are theorized to be adaptive based on their history of caregiving. We aim to fill this gap in the literature by examining whether infants' attachment security is associated with attachment-relevant emotion regulation strategies, such as balanced-regulation, hypo-regulation, and hyper-regulation strategies during relationship threatening discussions in adulthood (Table 1).

The Current Study

Using existing data from the Minnesota Longitudinal Study of Risk and Adaptation (MLSRA; Sroufe, Egeland, Carlson & Collins, 2005), we examined whether infant attachment prospectively predicts attachment-relevant emotion regulation strategies in adulthood (see Table 1). Infants' attachment status (secure versus insecure) was assessed at 12 and 18 months in the Strange Situation (Ainsworth et al., 1978). Integrating prior theory and research summarized above, we identified attachment-relevant emotion regulation strategies that should map onto secure, avoidant, and anxious attachment patterns in adulthood (see Table 1). These emotion regulation strategies were assessed in a video-recorded situation in adulthood—discussing a major conflict with their romantic partner at ages 20, 23, 26, and/or 35. Relationship conflict requires adaptive emotion regulation for optimal interpersonal functioning (Kobak & Duemmler, 1994; Simpson & Rholes, 2012). Thus, we had observational assessments in both infancy and adulthood in specific, age-appropriate, attachment-relevant situations spanning 20 to 30 years.

Notably, unlike the adult attachment literature that assesses individuals' level of attachment anxiety and avoidance, prior practices in the developmental literature have typically classified infant attachment as 'secure' versus 'insecure' because these samples typically do not have enough participants to distinguish secure, anxious, or avoidant attachment styles. In instances where infant attachment is assessed at 12 *and* 18 months (as in the MLSRA), infant attachment assessments have typically reflected the number of times that infants were rated secure (0, 1, or 2 times; Sroufe et al., 2005). This continuous approach, however, assumes a linear progression of insecurity that does not reflect other perspectives in the attachment literature, including the view that attachment can be unstable across time (Groh et al., 2014; Scharfe, 2003; Fraley & Roisman, 2019). Accordingly, we wanted to compare different patterns of infant attachment (similar to the approach taken by Vaughn, Egeland & Sroufe, 1979): infants rated as secure at both 12 and 18 months (stable secures), infants rated as insecure at both 12 and 18 months (stable insecurities), and infants rated as insecure at only *one* of the two times during infancy (unstable insecurities). Nonetheless, given that previous work has examined continuous measures of infant attachment insecurity, we also present the results based on the continuous measure of attachment insecurity.

Consistent with the prior literature, we expected that any form of insecure attachment in childhood should undermine emotion regulation compared to secure attachment. Thus, we predicted that, compared to stable secure infants, stable insecure infants and unstable insecure infants would display fewer balanced-regulation strategies and poorer regulation

strategies (i.e., hypo-regulation or hyper-regulation) during major conflict discussions with their romantic partners in adulthood. We did not, however, derive hypotheses about the specific maladaptive regulation strategies (i.e., hypo-regulation or hyper-regulation) that might be associated with individuals who were stable insecure versus unstable insecure infants. Some prior research insinuates that individuals who were stable insecure infants might display the worst emotion regulation strategies in adulthood to the extent that their stable insecurity stems from consistently harsh caregiving environments, such as those fraught with poverty or low socioeconomic status (Szepeswol & Simpson, 2019). Individuals who were unstably insecure as infants, in contrast, may have been exposed to very different life experiences and caregiving environments, such as those containing frequent familial conflict, inconsistent financial resources, or tumultuous relationships on the part of their caregivers, resulting in different patterns of emotion regulation compared to individuals who were stably insecure as infants (Szepeswol & Simpson, 2019; Thompson & Calkins, 1996; also see Katz & Gottman, 1991; Zahn-Waxler & Kochanska, 1990).

The unique nature of the MLSRA also provided an opportunity for conceptual replication of the predicted associations examining adolescent attachment security with another developmentally relevant attachment figure—their closest friend at age 16 (Simpson et al., 2007; Sroufe, Egeland & Carlson, 1999)¹. Friendship security is particularly relevant given that attachment security develops across the life span through continued interactions with other developmentally relevant attachment figures (Bowlby, 1969; Thompson, 1999; Waters & Cummings, 2000). Given the foundational proposition that security earlier in life should shape later emotion regulation strategies, we hypothesized that—just as in infancy—adolescents rated as more insecure with their best friend would display less balanced and greater hypo-regulation or hyper-regulation regulation strategies during their conflict discussions in adulthood.

Method

Participants

The data were collected on participants involved in the Minnesota Longitudinal Study of Risk and Adaptation (MLSRA; Sroufe et al., 2005). All procedures were performed in accordance with the University of Minnesota institutional review board. This 40-year prospective study of initially at-risk children and their mothers began in 1975–76, when 267 women were recruited from Minneapolis public health clinics where they were receiving free prenatal care. Within the original sample, 58% of the primary participants (i.e., the children) were European-American, 14% were African-American, 3% were Native American/Latino, 16% were of mixed racial background, and 9% were unclassifiable because of missing data on their father's ethnicity. Fifty-five percent of the original sample was male.

¹We could not examine the association between adult attachment security toward romantic partners and attachment-relevant emotion regulation strategies because half of our observations (N = 93) were collected at 20 and 23 years old prior to when self-reported adult attachment was collected at 26 and 35 years old (N = 95). Furthermore, the measures of adult attachment that were collected at 26 and 35 years old employ different methods (e.g., Adult Attachment Interview versus Attachment Script Assessment, respectively) and focus (parents versus attachment across several important relationships), limiting our ability to combine these ratings.

We drew on an existing and unique longitudinal study to test our hypotheses, thus the sample size was determined by focusing on a subset of participants from the original sample ($N = 102$) who met two criteria: (1) their attachment status had been assessed in the Strange Situation (Ainsworth et al., 1978) when they were 12 and 18 months old, and (2) they had been videotaped trying to resolve a major conflict with their romantic partner at one or more of four waves during adulthood (at ages 20, 23, 26, and/or 35). We utilized each individual's data across all assessment waves to maximize power, increase reliability of assessment, and maximize the use of data available. In order to be videotaped at one or more of these waves, targets (i.e., participants in the MLSRA) had to be involved in a romantic relationship that had existed for at least 4 months at that wave to ensure they could identify a major conflict. One hundred and one couples were heterosexual, and one couple was in a same-sex relationship. Forty-two of the 102 participants (41.18%) completed two or more relationship assessments with the same partner. Descriptive statistics for the mean age of participants and relationship length at each wave is available in Table 2. This subsample did not differ from the original sample on socioeconomic status (measured prenatally, at age 16, or in adulthood), gender, ethnicity, or attachment security.

Procedure and Measures

The MLSRA contains numerous measures collected at various stages of participants' social development. We focus on the specific measures relevant to testing our predictions.

Infant-Mother Attachment Security—The quality of each mother-infant attachment relationship was assessed using Ainsworth's Strange Situation Procedure (see Ainsworth & Wittig, 1969) when target participants were 12 and 18 months old. The Strange Situation Procedure is a 20-minute laboratory procedure during which infants are exposed to a series of stressful separations from and reunions with their primary caregiver (the mother in the MLSRA), some of which also involve the presence of a stranger in the room. The behavioral coding of attachment status (i.e., secure or insecure) focuses on how infants interact with and manage their emotions vis-à-vis their caregiver during reunions. Parent-child dyads in which infants turn to and use their mothers as a source of comfort and support, regulate their negative emotions well (calm down), and then resume play or exploration in the room, are classified as secure. Parent-child dyads in which infants either do not turn to or effectively use their mothers as a source of comfort and support, are not able to regulate their negative emotions (remain distressed), and do not resume play or exploration, are classified as insecure.

Infant attachment security classifications were coded based on how each infant responded to the separations and reunions with their mother. Rater agreement for attachment classification at 12 months was 89% and was 93% at 18 months (Egeland & Farber, 1984). Infant attachment ratings at 12- and 18-months are displayed in Table 3. Similar to other samples, the number of anxious (anxious/resistant) and avoidant (anxious/avoidant) individuals in our sample was low, preventing us from having the statistical power needed to analyze our data according to secure, anxious, or avoidant categories. Instead, secure attachment was coded 0 and insecure attachment was coded 1 at each assessment. To compare across the different patterns of attachment insecurity ratings at 12 and 18 months, these ratings were converted

to dummy-coded variables as follows: (a) *stable insecure* infants who were insecure at both 12 and 18 months (0 = no, 1 = yes; N = 21, 20.6%) and (b) *unstable insecure* infants who were insecure at only 12 or only 18 months (N = 34, 33.3%; 0 = no, 1 = yes). Individuals with ratings of 0 on both variables were *stable secure* infants who were secure at both 12 and 18 months (N = 47, 46.1%). We also created a continuous measure of infant attachment (0 = insecure at both 12 and 18 months, 1 = insecure at 1 time-point, 2 = secure at both time-points; Sroufe et al., 2005).

Adolescent Friendship Security with Best Friend—Each target participant’s degree of friendship security with their closest friend was rated from 1 (*low, insecure*) to 7 (*high, secure*) at age 16 from a comprehensive interview. This measure was based on the premise that attachment security vs. insecurity in later relationships should be facilitated by security in earlier relationships (Bowlby, 1969; Thompson, 1999; Waters & Cummings, 2000) and has been used previously to indicate friendship security (Simpson et al., 2007). The comprehensive interview was designed to examine identity development and adolescent functioning in different domains, including occupation, religion, politics, friendship, and dating (Grotevant & Cooper, 1981). Interviewers were blind to participants’ infant attachment ratings. Each interview consisted of about 120 main questions (with sub components based on how adolescents answered questions), 22 of which asked specifically about the adolescent’s closest friend. Example questions included, “How sure are you that your friend will be there for you?” and “Has there ever been a time when you thought your friendship would end? Why? How did you feel about that?” Coders, who were also blind to participants’ infant attachment ratings, listened to the audio-recorded responses to these questions to assess friendship security. Coders’ ratings were based on target participants’ descriptions of their closest friendship, including the degree to which the target participant shared or withheld emotional or difficult information from their closest friend, was confident that their friend accepted them, and expected that their friend would be available and supportive when needed. Because coders were experts and trained to specific coding criteria, two trained coders rated 25 – 35% of the sample on global friendship security on a 7-point scale. Once reasonable interrater reliability was established (ICC = .59; the Spearman-Brown correction was .74), 1 coder rated the remainder of the sample.

Adulthood Attachment-Relevant Emotion Regulation Strategies—Target participants who were involved in a romantic relationship lasting at least 4 months participated with their partners in a laboratory session at ages 20, 23, 26, and/or 35. Participants and their partners were first interviewed separately and then completed a battery of self-report measures that assessed the functioning of their relationship. Each couple member then completed a relationship problem inventory privately to identify and rate the most salient problems in the relationship. Each couple reviewed these together and chose the one problem that caused the most conflict in their relationship. Couples were then asked to discuss the chosen problem and attempt to reach a solution in a 10-min video-recorded discussion. These interactions were subsequently coded by trained observers for the three emotion regulation strategies described in Table 1.

As summarized in Table 1, we used a new behavioral coding schedule (Overall & Girme, 2014) based on attachment-relevant regulation strategies identified using similar observational methods during infancy (see Strange Situation Procedure; Ainsworth & Wittig, 1969), theorized about in the adult attachment literature (Mikulincer & Shaver, 2016; Shaver & Mikulincer, 2002; see Table 1, first column), and emotion regulation strategies documented in the developmental and emotion regulation literatures (Pallini et al., 2018). Notably, a recent meta-analytic factor analysis provided evidence of the most commonly reported emotion regulation strategies in adulthood that cohere to the three emotion regulation strategies we identified (Naragon-Gainey et al., 2017; see Table 1, middle column). The current approach allows us to (1) reflect on broad patterns of regulation that capture behaviors and emotion expressions that underpin the shared similarities in theorized attachment regulation strategies and empirically supported emotion regulation categories, and (2) allows us to utilize observational assessments at different ages (infancy versus adulthood) and within developmentally-appropriate attachment-relevant situations (Strange Situation Procedure versus major relationship conflict interactions).

Coders who were blind to the identity of the target participant and their infant attachment scores rated the extent to which both partners engaged in the three types of attachment-relevant emotion regulation strategies (see Table 1). (See the online supplementary materials [OSM] for a more detailed presentation of the coding schedule; also see Low et al., 2018 for an example of the use and validity of this coding schedule during similar relationship conflict discussions). The *balanced-regulation* strategy involves acknowledging the problem, taking active efforts to make progress toward solving the problem collaboratively, and open, self-assured disclosure of thoughts, opinions and emotions. The *hypo-regulation* strategy involves a lack of engagement with the partner, and the adoption of a passive and dismissing approach to problem-solving that is conveyed by superficial, non-intimate disclosures and suppressed or constrained emotional expressions. The *hyper-regulation* strategy involves clear engagement in the discussion but in ways that fixate on and amplify the symptoms, causes, and consequences of the problem rather than solutions to it. This strategy also emphasizes the need to be more heard and cared for by the partner, which are conveyed by the expression of exaggerated emotions or trying to ‘pull’ emotions from their partner (e.g., love, guilt) to obtain reassurance.

Two coders independently rated the degree to which each couple member engaged in each of these emotion regulation strategies during their attempt to resolve the major relationship disagreement (1–2 = *low*, 3–5 = *moderate*, 6–7 = *high*). In determining scores, coders started from a baseline of 1 (no presence of emotion regulation strategy) and moved upward on the scale as indicators of each emotion regulation strategies were displayed, taking into account indicator frequency, duration and intensity. Coders’ ratings for individuals’ balanced-, hypo-, and hyper-regulation strategies were reliable (ICCs = .947, .945, and .923 respectively) and were averaged.²

²Individuals’ balanced-regulation was negatively associated with both hypo-regulation (balanced-regulation → hypo-regulation: $B = -.63$, $t = -11.31$, $p < .001$) and hyper-regulation (balanced-regulation → hyper-regulation: $B = -.34$, $t = -5.61$, $p < .001$) strategies, but hypo- and hyper-regulation strategies were not associated with one another (hyper-regulation → hypo-regulation: $B = -.11$, $t = -1.32$, $p = .19$) supporting that they represent distinct emotion regulation strategies.

Results

Descriptive statistics across each wave are displayed in Table 2. We assessed attachment-relevant emotion regulation strategies across all available waves of romantic conflict discussion data. Thus, some MLSRA participants (targets) contributed more than one wave of romantic conflict data. Specifically, 48 participants contributed just one wave of data, 31 contributed two waves of data, 14 contributed three waves of data, and 9 contributed all four waves of data, giving us a total of 188 observations (average wave per person = 1.84). Given the nested structure of our data (i.e., waves nested under individuals), we followed Bolger and Laurenceau's (2013) recommendations for analyzing repeated measures data, using the MIXED procedure in SPSS 24 and applying an autoregressive covariance structure across all statistical models described below. Furthermore, Restricted Maximum Likelihood (REML), the default estimation technique when using the MIXED procedure in SPSS, accounts for missing data without excluding participants who completed only 1 to 3 waves of data by weighting the extent to which the effect for each participant contributes to the total effect, given the reliability of their data (i.e., the number of measurements; see Bolger & Laurenceau, 2013).

Does Infant-Mother Attachment Predict Emotion Regulation Strategies in Adulthood?

Attachment Insecurity Patterns and Emotion Regulation in Adulthood—We first ran a series of multilevel models that regressed individuals' emotion regulation strategies in adulthood onto their infant attachment insecurity dummy-coded variables, which indexed (a) *stable insecure* infants who were insecure at both 12 and 18 months (0 = no, 1 = yes) and (b) *unstable insecure* infants who were insecure at only 12 or only 18 months (0 = no, 1 = yes). Individuals with ratings of 0 on both variables, therefore, were *stable secure* infants who were secure at both 12 and 18 months. The results are presented in Table 4 (top section). Compared to individuals classified as stable secure in infancy, those classified as stable insecure in infancy displayed lower balanced-regulation and greater hypo-regulation strategies 20–35 years later during discussion of a major conflict with their romantic partner. Moreover, relative to individuals classified as stable secure in infancy, individuals classified as unstable insecure in infancy displayed greater hyper-regulation strategies while discussing a conflict with their romantic partner in adulthood. These associations support a key premise of attachment theory that infant security provides a foundation for emotion regulation across the life span. In particular, these data offer the first evidence spanning 20–35 years that infant attachment observed in the strange situation at 12 and 18 months prospectively predicts emotion regulation strategies observed in adult conflict interactions at 20–35 years of age in theoretically relevant ways.

Continuous Attachment Security and Emotion Regulation in Adulthood—Our aim was to examine how different patterns of infant attachment across 12 and 18 months (i.e., stable secures, stable insecure, and unstable insecure) were associated with attachment-relevant emotion regulation strategies in adulthood. However, readers might be curious to know the results based on a continuous measure of infant attachment, as has been used in prior research. Thus, we re-ran our analyses using a continuous measure of infant attachment (0 = insecure at both 12 and 18 months, 1 = insecure at 1 time-point, 2 = secure

at both time-points; Sroufe et al., 2005). As shown in Table 5, the results suggest that as the number of times infants were classified as secure increased, hypo-regulation decreased. There was no association between continuous infant attachment and hyper-regulation or balanced-regulation strategies. As did our primary analyses in Table 4 (top section), these results support that infant security observed in the strange situation at 12 and 18 provide a foundation for emotion regulation across the life span, and in particular being rated insecure more times during infancy predicts hypo-regulation strategies during adult attachment-relevant interactions. However, this comparison also illustrates that examining different patterns of infant attachment based on the *stability* of secure versus insecure classification yield unique insights that a continuous measure of infant attachment might not capture, such as predicting balanced-regulation and hyper-regulation strategies in adulthood. We further consider these distinctions in the discussion.

Does Friendship Security in Adolescent Predict Emotion Regulation Strategies in Adulthood?

Next, we wanted to conceptually replicate the associations between earlier attachment security and later emotion regulation strategies in adulthood using a measure of attachment security during another developmentally relevant period – participants’ friendship security with their closest friend at age 16. We ran a series of multilevel models that regressed individuals’ emotion regulation strategies in adulthood onto their friendship security ratings (1 = more insecure, 7 = more secure), and controlled for the infant attachment insecurity dummy-coded variables, which indexed: (a) stable insecure infants who were insecure at both 12 and 18 months (0 = no, 1 = yes), and (b) unstable insecure infants who were insecure at only 12 or only 18 months (0 = no, 1 = yes). Thus, any resulting associations between friendship security and emotion regulation strategies in adulthood represent independent associations beyond the effects of infant security. The results are presented in Table 4 (bottom section). Revealing a similar pattern of results as infant attachment insecurity, adolescents with greater friendship insecurity displayed worse balanced-regulation, and greater hypo-regulation and hyper-regulation strategies, 4–14 years later during discussion of a major conflict with their romantic partner.³ Our results also demonstrate that the association between infant insecurity and hypo- and hyper-regulation strategies remained significant, but the association between stable infant insecurity and balanced-regulation did not. This is consistent with prior developmental models in which pathways of security progress into later relationships. However, our results also indicate that attachment insecurity in both infancy and adolescent make independent contributions to hypo- and hyper-regulation strategies. Thus, these results demonstrate the strong and persistent impact of infant insecurity that does not necessarily work indirectly through later insecurity processes.

Alternative Explanations

The association between infant and adolescent attachment security and emotion regulation strategies might be influenced by the immediate relationship environment. Thus, we re-ran

³Some readers might wonder whether the association between infant attachment security and adult regulation strategies occurs through friendship security at age 16. We found weak evidence for indirect effects, which are outlined in the OSM.

the analyses reported in Table 4 controlling for the *partners'* emotion regulation strategy that was identical to the dependent variable in each model (e.g., controlling for partners' balanced-regulation strategy, when predicting individuals' balanced-regulation strategy). Controlling for partners' emotion regulation did not alter the association between infants' stable insecurity and greater hypo-regulation strategies ($t = 2.87, p = .005$) or infants' unstable insecurity and greater hyper-regulation strategies ($t = 2.44, p = .017$). However, the association between infants' stable insecurity and lower balanced-regulation strategies was no longer significant when controlling for the shared association between dyads ($t = -1.44, p = .154$). Furthermore, controlling for partners' emotion regulation did not alter the significant associations between friendship security and hypo-regulation ($t = -2.15, p = .035$), hyper-regulation ($t = -2.17, p = .034$), or balanced-regulation strategies ($t = 2.90, p = .005$).

We also explored whether insecure infants' tendencies to engage in poorer emotion regulation in adulthood might be buffered by partners' emotion regulation strategies (Simpson & Overall, 2014; Overall & Simpson, 2015). We re-ran our analyses and included partners' emotion regulation strategies as a moderator. Additional analyses provided little evidence that romantic partners' regulation strategies during the conflict discussions buffered the link between infant attachment security and adult regulation strategies ($ts < -1.68, ps > .95$), with one exception that demonstrated an exacerbating (rather than a buffering) effect of hyper-regulation strategies in combination with partners' hypo-regulation strategies (see OSM for details). Taken together, these additional analyses indicate that infant and adolescent attachment security play an important role in the development of adult emotion regulation strategies, over and above peoples' immediate relationship environment.

General Discussion

A founding premise of attachment theory is that infant attachment shapes the development of emotion regulation strategies across the life span. We provide novel evidence of this proposition by using data from a unique longitudinal study (MLSRA) that assessed attachment insecurity in infancy, friendship insecurity at age 16, and theoretically relevant emotion regulation strategies in threatening conflict interactions in adulthood 20–35 years later. The results supported that attachment insecurity was associated in theoretically relevant ways with specific emotion regulation tendencies that should emerge given an individual's earlier attachment history (see Table 1), including lower *balanced-regulation* (open, approach-orientated, engaging in collaborative problem-solving), greater *hypo-regulation* (suppressing emotions, disengaging, engaging in superficial problem-solving), and greater *hyper-regulation* (exaggerating their emotional expressions, ruminating, being self-focused in processing issues). Below, we discuss the specific findings and their theoretical and practical implications.

Infant-Mother Attachment Patterns Predict Regulation Strategies in Adulthood

Compared to individuals classified as *stable secure infants*, those classified as *stable insecure infants* (insecure at 12 and 18 months) displayed lower balanced-regulation and greater

hypo-regulation strategies 20–35 years later while discussing a conflict with their romantic partner. Providing conceptual replication, greater friendship insecurity at age 16 predicted worse balanced-regulation and greater hypo-regulation patterns in adulthood. This result was also consistent with secondary analyses using the continuous measure of infant attachment insecurity: infants who were rated as secure more often (at both 12 and 18 months) displayed lower hypo-regulation strategies 20–35 years later. The results are important given that hypo-regulation strategies undermine psychological wellbeing, health, and interpersonal functioning (for recent meta-analytic reviews see Aldao et al., 2010; Chervonsky & Hunt, 2017; 2019). Another important finding that emerged, was that compared to stable secure infants, *unstable insecure infants* (insecure at 12 or 18 months) displayed greater hyper-regulation strategies in adulthood. Providing conceptual replication, greater friendship insecurity at age 16 also predicted greater hyper-regulation patterns in adulthood. However, this finding did not emerge when examining the continuous measure of infant attachment security.

Why did inconsistencies emerge when predicting hyper-regulation strategies in adulthood? It might be possible that changes in attachment classification from 12- to 18-months old reflect error or unreliability in measurement. Specifically, given that the proportion of unstable infant attachment was so large (33.3%), it might be the case that the Strange Situation Procedure may not be sensitive enough to tease apart attachment-related changes vs. non-attachment-related factors that may also shape emotion regulation strategies (e.g., child illness, parent-child relationship stress, infants' temperament; Katz & Gottman, 1991; Khan et al., 2019; Szepeswol & Simpson, 2019; Thompson & Calkins, 1996). Nonetheless, the 33.3% of individuals who experienced unstable infant attachment aligns very closely to research suggesting that categorical attachment ratings remain stable 60% of the time and that people experience considerable change in attachment security across time (Groh et al., 2014; Scharfe, 2003; Fraley & Roisman, 2019). Having a third of our at-risk sample experience unstable attachment ratings is also consistent with work demonstrating that individuals who experience significant within-person variation in attachment across time have more turbulent family histories (Davila, Burge & Hammen, 1997; Vaughn et al., 1979). Fluctuations in attachment also have meaningful consequences (Girme et al., 2018; La Guardia, Ryan, Couchman & Deci, 2000). For example, individuals who experience greater fluctuations in their relationship-specific attachment security report lower relationship satisfaction over time, especially if they are secure and expect relationship stability (Girme et al., 2018). Similarly, unstable infant attachment patterns are associated with greater hyper-regulation strategies in adulthood, highlighting how instability in infant attachment predicted a theoretically-relevant emotion regulation strategy. Thus, it is unlikely that unstable attachment patterns reflect measurement error, and may instead reflect meaningful differences in conceptualizing attachment stability.

The inconsistencies between analytic strategies might suggest that our analysis on patterns of infant attachment stability yield more insightful associations between patterns of infant attachment and emotion regulation strategies that might be missed when examining continuous measures of infant attachment. Prior research on infant attachment has predominately treated infant attachment as a continuous measure, where infants' attachment scores reflect how many time-points the infant was rated as secure (0, 1, or 2 times; Sroufe

et al., 2005). However, by treating each pattern of attachment insecurity independently (stable secure, stable insecure, and unstable insecure), this application recognizes that the differences in the stability of infant insecurity may reflect different caregiving histories and early life environments that can interfere with parents' caregiving and responsiveness, and undermine children's development of adaptive emotion regulation (Main, 1990; Cassidy, 1994; Szepeswol & Simpson, 2019). More specifically, compared to stable security in infancy, individuals who had *stable insecurity* in infancy may have had harsher upbringings (e.g., low socioeconomic background, poverty; Szepeswol & Simpson, 2019) and/or unresponsive or rejecting caregiving, which could mean that individuals have trouble being open and comfortable with their emotions (lower balanced-regulation strategies), and suppress their emotions or disengage from uncomfortable situations in order to protect themselves from hurt (greater hypo-regulation strategies).

In contrast, individuals who had *unstable insecurity* in infancy may have experienced a very different environment that was fraught with an unstable home life (e.g., inconsistent financial resources, family conflicts; Szepeswol & Simpson, 2019) and/or inconsistent caregiving. Indeed, unstable security in infancy (changes from secure to anxious) is associated with greater stressful life events (e.g., mothers' reports about work, health, finances), compared to stable security in infancy (Vaughn et al., 1979). Furthermore, infants with unstable backgrounds (parental depression, domestic violence, or chronic parent-child relationship stress) become hypervigilant to cues of impending conflict, experience ambivalent responses to parents, and experience heightened distress (Katz & Gottman, 1991; Khan et al., 2019; Thompson & Calkins, 1996), which are similar to the hyper-regulation strategies associated with people who exhibited unstable insecurity in infancy (also see Cassidy, 1994; Cassidy & Berlin, 1994; Main, 1991). Thus, the current approach provides a novel way of examining stable vs. unstable patterns of infant attachment insecurity that reveal meaningful differences in emotion regulation. Nonetheless, our conceptualization of patterns of infant attachment is rooted in theories on within-person variation in attachment, and future research should aim to replicate these effects.

Theoretical and Practical Implications

Focusing on attachment theory helped to integrate the massive literature on emotion regulation strategies. The three patterns of emotion regulation identified here (see Table 1) align with the three common emotion regulation factors recently identified (Naragon-Gainey et al., 2017), but go further to suggest that each category has distinct developmental underpinnings. This advances the emotion regulation literature by clarifying our understanding of *why* people develop certain emotion regulation strategies and, in doing so, has practical implications for how insecure individuals could develop more balanced and constructive strategies for managing their emotions. Although we cannot change peoples' caregiving histories, working on fostering security in adulthood to overcome negative expectations may help to override the automatic strategies developed in infancy (see Main, 1990). Perhaps more importantly, these results may help inform individuals' parenting strategies, given that parents' emotion regulation shapes how parents cope with the demands of caregiving (Rutherford, Wallace, Laurent & Mayes, 2015), which should have

implications for their children's attachment security (Bowlby, 1973) and the intergenerational transmission of emotion regulation strategies (Rutherford et al., 2015).

The current research also clarifies that hypo- and hyper-regulation strategies most likely stem from different early life and caregiving experiences, which may require tailored therapeutic approaches. Individuals who develop a hypo-regulation strategy may benefit from having their emotional experiences accepted and validated, whereas those who develop a hyper-regulation strategy may benefit more from having their feelings downregulated before their heightened emotions are triggered (see Simpson & Overall, 2014; Overall & Simpson, 2015). Existing therapeutic approaches also involve similar strategies for discouraging the suppression of negative feelings and promoting open and constructive communication of negative feelings (Johnson, 2015) or practicing exposure to situations that elicit negative feelings or stress to help deal with situations that trigger trauma or anxiety (Foa & Kozak, 1986). Nonetheless, the current paper provides valuable extensions by distinguishing between different patterns of emotion regulation and shedding light on one way in which emotion regulation strategies may develop.

Caveats about Longitudinal Attachment Research and Future Directions

Like many other longitudinal studies, our dataset was not designed to test the specific processes reported here, which has implications for gaps and inconsistencies in our research (Dozier et al., 2005). For example, we do not have sufficient data on adult romantic attachment orientations, which limited our ability to test whether infant attachment predicts adult romantic attachment (Fraley, 2002; although also see Fraley & Roisman, 2019), which in turn might be a more proximal predictor of emotion regulation in adulthood. Indeed, several pathways may explain developmental processes leading from infancy to adulthood (Hill, Edmonds & Jackson, 2019), but the underlying mechanisms that explain *how* infant-mother attachment impacts attachment-relevant emotion regulation strategies within adult romantic relationships remain unclear. Beyond infant attachment representations, insecure infants may learn maladaptive regulation strategies from their caregivers (Kim, Pears, Capaldi & Owen, 2009; Low et al., 2018) or employ emotion regulation strategies due to genetic predispositions (Hariri & Holmes, 2006) or unconscious physiological processes (Calkins, Dedmon, Gill, Lomax & Johnson, 2002).

Furthermore, given the relatively low numbers of insecure infants in our sample, we were unable to examine associations between secure, anxious, and avoidant categories and attachment-relevant emotion regulation strategies in adulthood. As is common in attachment research with children, anxious and avoidant infants were combined into an "insecure" category, which may camouflage the unique strategies anticipated for anxious (hyper-regulation) vs. avoidant (hypo-regulation) individuals. Furthermore, our attachment patterns did not distinguish between the direction of change (secure → insecure vs. insecure → secure). Although changes from secure to insecure attachment might be more jarring (Girme et al., 2018), attachment instability during infancy, regardless of the direction of change, may be sufficient to generate hyper-regulation strategies. Small sample sizes limit these types of distinctions in many longitudinal attachment studies (Dozier et al., 2005). Well-

powered longitudinal studies designed to address these a priori hypotheses would help to address these concerns (Brumariu, 2015).

Our assessment of infant-mother attachment patterns in the Strange Situation procedure may also be an imprecise measure of infant attachment. The pattern of effects we found between infant-mother attachment and individuals' emotion regulation strategies utilized many years later in romantic relationships makes a unique and significant contribution to both the attachment and the emotion regulation literatures. Nonetheless, the Strange Situation procedure provides only a 'snapshot' of parent-child interactions, and it does not assess how parents respond to children across different contexts (Dozier et al., 2005; Grossmann et al., 2005). Supporting the need to focus on more specific types of attachment interactions, Grossmann et al. (2005) found that infant attachment assessed via the Strange Situation did *not* significantly predict attachment security in adulthood, but more focused assessments of parental sensitivity and support during children's exploration did predict attachment security in adulthood (although both assessments did significantly predict emotion regulation during childhood and adolescence). Future research should consider multiple conceptualizations of attachment security rather than relying on only one operationalization of attachment security (Dozier et al., 2005; Grossmann et al., 2005).

Similarly, infant attachment insecurity may be better represented by assessing attachment security repeatedly across time and across multiple attachment relationships (Dagan & Sagi-Schwartz, 2018; Grossmann et al., 2005). We were restricted to assessing infants' attachment at just two time-points. Assessing infant attachment multiple times, however, is likely to provide more accurate measurements of infant attachment across daily life (Dozier et al., 2005) and developmental phases (Grossmann et al., 2005). Multiple assessments of infant attachment are especially important to more reliably assess the presence and consequences of stable versus unstable patterns of infant attachment across time. Finally, we only examined infant-mother attachments, but infant-father attachments are also likely to play an important role in shaping emotion regulation patterns (Dagan & Sagi-Schwartz, 2018; Grossmann et al., 2005). Future research should consider examining both infant-mother and infant-father relationships to more comprehensively assess attachment processes that shape emotion regulation patterns across time.

Conclusions

The current research integrated the developmental and emotion regulation literatures to identify specific attachment-relevant emotion regulation strategies: balanced-regulation (being open, approach-orientated, and collaborative problem-solving), hypo-regulation (suppressing emotions, disengaging, and superficial problem-solving), and hyper-regulation (exaggerated emotional expressions, rumination, and self-focused processing). The results offer novel evidence that infant attachment insecurity prospectively predicts attachment-relevant emotion regulation strategies in adulthood 20–30 years later. This research opens up new avenues of study to examine factors and mechanisms that explain the connection between early attachment insecurity and different emotion regulation strategies employed in adulthood.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Table 1.

Attachment-Relevant Emotion Regulation Strategies Identified by Integrating Theoretical Perspectives in the Attachment Literature and Evidence from the Emotion Regulation Literature

Emotion Regulation Strategies in Adulthood Identified by Attachment Theory	Emotion Regulation Strategies in Adulthood Based on Meta-Analysis	Attachment-Relevant Emotion Regulation strategies in Adult Conflict Interactions
Coregulation strategies: seeking proximity to close others in constructive and adaptive ways, and trusting that close others will provide responsive support	Adaptive engagement: problem-solving and behaviors that involve reappraising or accepting negative events/outcomes	Balanced-Regulation: <i>Balanced emotion:</i> open, comfortable and self-assured expression and acknowledgement of emotions/feelings <i>Collaborative engagement:</i> accepting joint responsibilities, encouraging the partner's contribution to problem-solving, and operating as a team <i>Approach-oriented problem-solving:</i> constructive, direct efforts to move forward and solve the problem without dwelling on the causes and consequences
Deactivating strategies: suppressing/minimizing negative emotions to limit the hurt and disappointment that is expected to occur when depending on close others	Disengagement: attempting to avoid or shift focus from an emotionally-relevant situation by using distraction, expressive suppression, or disengagement to minimize the impact of negative feelings	Hypo-Regulation: <i>Hypo-emotion expression:</i> emotional elements of communication are muted and individual attempts to suppress or conceal his/her emotions <i>Avoidance/Disengagement:</i> lack of engagement and dismissing approach to the problem <i>Superficial problem-solving:</i> communication and any problem-solving is superficial, lacks depth, and 'skims the surface'
Hyperactivating strategies: exacerbating negative emotional expressions and dependence on close others to re-establish and maintain others' attention and care	Aversive cognitive perseveration: over-engagement with, or difficulty disengaging from, negative thoughts/feelings by ruminating, worrying, or avoiding negative experiences	Hyper-Regulation: <i>Hyper emotion expression:</i> exaggerated emotional expressions and pulling emotions from the partner <i>Ruminative problem engagement:</i> fixating on and amplifying the symptoms, causes and consequences of the problem, and one's own thoughts/feelings <i>Self-focused orientation:</i> focusing on own desires and needs, such as being heard and cared for by the partner

Table 2.

Descriptive Statistics (Means and Standard Deviations) for Demographic Measures, Friendship Security in Adolescence, and Emotion Regulation strategies in Adulthood.

	Adolescence (16 years old)		Wave 1 (20 years old)		Wave 2 (23 years old)		Wave 3 (26 years old)		Wave 4 (35 years old)	
	M	SD	M	SD	M	SD	M	SD	M	SD
Participant Age (years)	15.73	0.47	20.16	0.74	22.59	0.64	26.62	0.86	34.98	0.86
Relationship Length (months)	-	-	26.16	20.62	35.38	20.21	55.09	32.58	100.50	68.14
Friendship Security	4.58	1.36	-	-	-	-	-	-	-	-
Balanced-Regulation strategy	-	-	2.80	1.26	3.20	1.30	3.73	1.29	3.26	1.66
Hypo-Regulation strategy	-	-	2.61	1.41	1.87	0.87	2.03	1.18	2.67	1.72
Hyper-Regulation strategy	-	-	1.96	1.21	2.30	1.31	1.61	1.08	2.26	1.27
Partners' Balanced-Regulation strategy	-	-	2.96	1.33	3.31	1.62	3.80	1.32	3.57	1.73
Partners' Hypo-Regulation strategy	-	-	2.39	1.42	2.13	1.12	1.83	1.04	1.91	1.29
Partners' Hyper-Regulation strategy	-	-	2.26	1.56	2.07	1.51	1.73	0.91	2.84	1.57

Note. Friendship security and emotion regulation strategies were assessed on a scale ranging from 1 to 7. Emotion regulation strategies were observed during interactions with romantic partners at each wave, but each wave had a different sample size based on whether participants were involved in romantic relationships or participants in that wave of data collection. Each individual's emotion regulation scores were used across all assessment waves in the analyses to maximize power, increase reliability of assessment, and maximize the use of data available.

Table 3.

Frequency of Infant-Mother Attachment Ratings during the Strange Situation at 12- and 18-Months.

Infant Attachment Ratings at 12-Months	Infant Attachment Ratings at 18-Months			Totals
	Secure	Avoidant	Anxious	
Secure	47	12	3	62 (60.8%)
Avoidant	11	8	4	23 (22.5%)
Anxious	8	2	7	17 (16.7%)
Totals	66 (64.7%)	22 (21.6%)	14 (13.7%)	102 (100%)

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Table 4.

Associations between Infant Attachment Status (12 and 18 months) and Adolescent Attachment Security (Age 16) and Adult Emotion Regulation Strategies (between 20 and 35 years).

	Adults' Balanced-Regulation Strategies					Adults' Hypo-Regulation Strategies					Adults' Hyper-Regulation Strategies							
	<i>B</i>	<i>t</i>	<i>p</i>	95% CI		<i>B</i>	<i>t</i>	<i>p</i>	95% CI		<i>B</i>	<i>t</i>	<i>p</i>	95% CI				
				Low	High				Low	High				Low	High			
Infants' Attachment to Mother																		
Intercept	3.28	19.27	.000	2.94	3.62	.89	2.29	14.01	.000	1.96	2.61	.83	1.75	12.36	.000	1.47	2.03	.82
Stable Insecures	-.65	-2.02	.045	-1.29	-.01	.19	.91	2.95	.004	.30	1.53	.27	.18	.66	.511	-.36	.72	.07
Unstable Insecures	-.05	-.21	.834	-.57	.46	.02	-.16	-.64	.524	-.66	.34	.07	.59	2.73	.008	.16	1.02	.30
Adolescents' Attachment to Closest Friend																		
Intercept	3.28	19.12	.000	2.94	3.62	.90	2.30	13.99	.000	1.98	2.63	.84	1.74	12.97	.000	1.47	2.00	.85
Adolescent Security	.27	3.14	.002	.10	.44	.32	-.19	-2.31	.024	-.03	-.36	.25	-.16	-2.32	.024	-.02	-.29	.28
Stable Insecures	-.58	-1.76	.081	-1.24	.07	.17	.87	2.73	.008	.24	1.50	.27	.13	.48	.635	-.40	.65	.05
Unstable Insecures	-.06	-.24	.809	-.59	.46	.03	-.14	-.57	.571	-.64	.36	.06	.51	2.47	.016	.10	.91	.29

Note. Infant attachment ratings were dummy-coded. Stable insecure infants were rated insecure at both 12 and 18 months. Unstable insecure infants were rated insecure at either 12 or 18 months. The model intercept reflects Stable Secure infants' emotion regulation scores. Adolescent security was rated by interviewers (1 = insecure, 7 = secure). Significant effects are highlighted in bold. Effect sizes (*r*) were computed using Rosenthal and Rosnow's (2007) formula: $r = (\sqrt{f^2 / (f^2 + df)})$. CI = confidence interval.

Associations between Continuous Infant Attachment Insecurity (12 and 18 months) and Adult Emotion Regulation strategies (between 20 and 35 years).

Table 5.

	Adults' Balanced-Regulation Strategies				Adults' Hypo-Regulation Strategies				Adults' Hyper-Regulation Strategies									
	<i>B</i>	<i>t</i>	<i>p</i>	95% CI	<i>r</i>	<i>B</i>	<i>t</i>	<i>p</i>	95% CI	<i>r</i>	<i>B</i>	<i>t</i>	<i>p</i>	95% CI	<i>r</i>			
																Low	High	Low
Infants' Attachment to Mother																		
Intercept	2.78	12.04	.000	2.32	3.24	.75	2.85	12.52	.000	2.40	3.30	.77	2.24	11.24	.000	1.83	2.62	.75
Infant Security	.28	1.80	.075	-.03	.58	.17	-.35	-2.28	.025	-.65	-.05	.22	-.18	-1.38	.170	-.45	.08	.14

Note. Significant effects are highlighted in bold. Effect sizes (*r*) were computed using Rosenthal and Rosnow's (2007) formula: $r = (\sqrt{f^2 / f^2 + df})$. CI = confidence interval.