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Adult Attachment Representations and the Quality of Romantic and Parent-Child Relationships: An Examination of the Contributions of Coherence of Discourse and Secure Base Script Knowledge

Theodore E. A. Waters,

New York University – Abu Dhabi

K. Lee Raby,

University of Utah

Sarah K. Ruiz,

University of Minnesota

Jodi Martin, and

York University

Glenn I. Roisman

University of Minnesota

Abstract

Attachment theory suggests that early experiences with caregivers are carried forward across development in the form of mental representations of attachment experiences. Researchers have investigated at least two representation-based constructs when studying attachment and successful adaptation in adulthood: (1) coherence of autobiographical discourse/memories and (2) knowledge of the secure base script. Here we present data examining the unique contributions of coherent discourse regarding childhood caregiving experience and secure base script knowledge in a prospective high-risk longitudinal study, the Minnesota Longitudinal Study of Risk and Adaptation (MLSRA). The current study included three indicators of the quality of romantic relationships: (1) observed quality of interaction with romantic partners, (2) self-reported relationship satisfaction, and (3) interview-rated effectiveness of romantic engagement. Parent-child relationship quality was also assessed across three key outcomes: (1) infant attachment security, (2) observations of supportive parenting, and (3) interview-rated supportive parenting. When examining both attachment representations simultaneously, each representation-based construct was uniquely associated with different relationship quality indices. Specifically, secure base script knowledge was uniquely associated with infant attachment security in the next generation, and coherence of discourse was uniquely associated with observations of romantic relationships quality and interview-rated supportive parenting.

Keywords

Secure Base Script; Attachment; Adult Attachment Interview; Parenting; Romantic Relationships; Representations

Attachment theory proposes that mental representations of childhood experiences with caregivers serve as the primary mechanism by which early attachment experiences impact later interpersonal functioning (e.g., Bowlby 1969/1982; 1973; 1980). The content and organization of these attachment representations are assumed to be contingent on the actual caregiving environment and interaction history of the parent-child dyad. Representations of attachment are believed to be relatively stable from childhood to adulthood, and to assist with organizing individuals' thoughts, feelings, and behavior within novel relationship contexts across adulthood, including romantic relationships and parent-child relationships.

Attachment representations in adolescence and adulthood are traditionally operationalized by developmental psychologists using the framework of the Adult Attachment Interview (AAI; Hesse, 2016; Main, Kaplan, & Cassidy, 1985). The AAI is a retrospective autobiographical interview that focuses on individuals' childhood experiences with primary caregivers. The traditional method of coding AAIs (Main, Goldwyn, & Hesse, 2003-2008) focuses on the internal consistency of adults' episodic/autobiographical memories of their childhood attachment-relevant experiences and relationships. In particular, individuals' attachment representations are assumed to be captured by a set of ratings of adults' attachment states of mind that focus on the overall coherence of the narratives produced and the rational/irrational ideologies presented during the interview (referred to as coherence of mind). Coherent discourse during the AAI has proven to be a valuable measure for understanding attachment processes across the life-course, yielding results consistent with the core hypotheses of attachment theory. For example, producing a coherent autobiographical narrative during the AAI has been linked with the quality of early caregiving experiences (e.g., Grossmann, Grossmann, & Kindler, 2005; Haydon, Roisman, Owen, Booth-LaForce, & Cox, 2014; Roisman, Madsen, Hennighausen, Sroufe, & Collins, 2001; Steele et al., 2014) and predicts behavior in romantic (e.g., Crowell, Treboux, Gao, Fyffe, Pan, & Waters, 2002; Holland & Roisman, 2010) and parent-child relationships (e.g., Shlafer, Raby, Lawler, Hesemeyer, & Roisman, 2015; Van IJzendoorn, 1995).

Recent theoretical developments suggest that attachment representations may also include a cognitive script summarizing the typical sequence of events following experiences of distress (e.g. Waters & Waters, 2006). It has been argued that when infants and children repeatedly experience responsive and supportive care during times of distress they construct a generalized representation of that supportive care in the form of a secure base script. Similar to other work on attachment representations, the secure base script is argued to be influential in shaping functioning in interpersonal relationships across development, including the novel relationship contexts during adulthood (e.g., romantic partnerships and parenting).

The addition of the secure base script construct to the field of attachment research spurred numerous validation studies, the results of which parallel those from the literature regarding adults' coherence of mind during the AAI. Specifically, variation in secure base script knowledge has its origins in childhood experiences with caregivers (Schoemaker et al., 2015; Steele et al., 2014; Vaughn et al., 2016; Waters, Ruiz, & Roisman, 2017). In terms of predictive significance, maternal secure base script knowledge has been associated with children's attachment security in the next generation within normative-risk samples, across

cultures, and in genetically unrelated parent-child dyads. For instance, Bost et al. (2006) examined maternal secure base script knowledge using the adult version of the Attachment Script Assessment (ASA; Waters & Waters, 2006) and the attachment security of mothers' preschool aged children assessed during several hours of home observation using the Attachment Behavior Q-set (AQS; Waters, 1995) in a normative-risk sample, revealing a significant positive association between maternal secure base script knowledge and child attachment security. Vaughn et al. (2007) reported significant positive correlation between observations of children's attachment behavior at home (measured by the AQS) and maternal secure base script knowledge across Columbian, Portuguese, and American samples (see also Coppola, Vaughn, Cassibba, & Costantini, 2006; Monteiro, Verissimo, Vaughn, Santos, & Bost, 2008); Verissimo and Salvaterra (2006) indicated similar results in a sample of adoptive mothers and their adopted children. Finally, Waters, Bosmans, Vandevivere, Dujardin, and Waters (2015) found that mothers' secure base script knowledge was positively associated with their children's attachment security in a normative-risk, middle childhood sample (assessed with a middle childhood version of the ASA).

Although the literature on secure base script knowledge is growing, significant gaps exist. In contrast to the extensive research on parental secure base script knowledge, childhood attachment security, and parenting behavior in normative risk samples (see also Coppola et al., 2006; Huth-Bocks, Muzik, Beeghly, Earls, & Stacks, 2014) studies of the links between secure base script knowledge and parent-child relationship functioning in higher-risk contexts have been exceedingly rare. Research examining the associations between secure base script knowledge and romantic relationship functioning, especially in samples exposed to higher-risk contexts, is also limited. The only study to date examining these associations identified positive links between secure base script knowledge and adults' caregiving and care seeking behavior during interactions with a romantic partner in a normative risk sample of engaged couples (Waters, Brockmeyer, & Crowell, 2013).

The vast majority of research on attachment representations has focused on *either* the autobiographical representations tapped by the traditional AAI coding system *or* the secure base script. The lack of comparative studies has left the field with a potentially significant "old wine in a new bottle" problem, meaning it is currently unclear if secure base script knowledge uniquely contributes to developmental outcomes central to attachment theory. This is especially pertinent in light of leading models of mental representations suggesting that scripts and autobiographical memories are not distinct, but rather are mutually informed and dependent on one another. For example, Conway and colleagues (Conway, 2005; Conway & Pleydell-Pearce, 2000; see also Schank, 1999; Schank & Abelson, 1977) have argued that scripts are abstractions or summaries of autobiographical memories and the retrieval and reconstruction of autobiographical memories are thought to be partly organized by scripts (see also Bakermans-Kranenburg, 2006).

To date, the only study examining the unique and joint contributions of both forms of attachment representations used AAI coherence of mind and secure base script knowledge coded from AAI transcripts and examined associations with secure base use and support behaviors in a normative-risk sample of engaged couples during conflict discussion (Waters et al., 2013). Results suggested that both forms of attachment representation constructs were

associated with unique variance in adult's attachment behaviors in romantic relationships, but that the majority of variance predicted in romantic behavior was shared by both forms of representation. Attempts at replication and extension of these findings are critical in advancing our understanding of the roles of scripted and autobiographical attachment representations in promoting functioning in close relationships across development. Theories of attachment-based cognitive processing (e.g., Bosmans & Kerns, 2015; Dykas & Cassidy, 2011) would be greatly informed by examining the relative contributions of these two widely studied representation-based constructs. As such, the current study attempted to replicate and extend the findings from Waters et al. (2013) by examining the relative contributions of both forms of attachment representations to mean levels of romantic and parent-child relationship functioning across young adulthood.

The Present Study

In the current study, we tested the replicability of the Waters et al. (2013) findings regarding the unique contributions of both scripted and autobiographical attachment representations to romantic relationship behavior. We extended those findings using questionnaire and interview assessments of romantic relationship quality, and conducted parallel analyses using multi-method assessment of parent-child relationships in the Minnesota Longitudinal Study of Risk and Adaptation (MLSRA; Sroufe, Egeland, Carlson, & Collins, 2005), a high-risk, prospective, longitudinal study of infants born into poverty and followed through age 39 years. MLSRA participants completed two assessments of adult attachment via the AAI (ages 19 and 26 years) which were coded for both coherence of mind and secure base script knowledge. Observational, interview, and questionnaire data on both parent-child and romantic relationship quality were collected at multiple ages during early adulthood. For the current study, functioning in each relationship domain was assessed using previously validated data from the MLSRA. When comparable data were collected at multiple time-points, these variables were composited to produce the most reliable and valid assessment of mean level functioning for the construct in question.

The current study included three variables related to romantic relationship quality: (1) observed quality of interaction with romantic partners, (2) self-reported relationship satisfaction, and (3) interview-rated effectiveness of romantic engagement. Parent-child relationship quality was also assessed across three key outcomes: (1) infant attachment security, (2) observations of parenting quality, and (3) interview-rated parenting quality. Based on the extant research, we hypothesized that secure base script knowledge would be significantly associated with variance in all romantic and parent-child relationship outcomes at the bivariate level. Based on results from Waters et al. (2013), we also hypothesized that when examined *together* both secure base script knowledge and AAI coherence of mind scores would be significantly and uniquely associated with variance in the outcome variables.

Method

Participants

Between 1975-1977, pregnant women who were living below the poverty line and were receiving prenatal services from the local Minneapolis health department were recruited for participation in the MLSRA. At the time of their child's birth, 48% of mothers were teenagers, 65% were single, and 42% had not completed high school. The current subsample involved infants born to these mothers who have been followed into adulthood, and completed an AAI at age 19 and/or age 26 years, known as the first generation participants (G1; $N = 178$). This subsample did not significantly differ from the original sample ($N = 267$) with respect to maternal age, marital status, or maternal education at the time of the child's birth. Within this subsample, 47% were female, and 66% were non-Hispanic Caucasian, 18% were multiracial, 10% were African American, and 2% were Native American, Hispanic, or Asian American (paternal ethnicity data were unavailable for 4%). The average age of G1 participants at their first child's birth was 20.60 years of age ($SD = 3.40$). Infant attachment data were collected from these second-generation infants (G2; $N = 57$) at age 12 to 21 months, and G1 participants were observed interacting with their children when their children were between the ages of 24 and 42 months old ($N = 96$).

Measures: Attachment Representations

Autobiographical representations of early caregiving experiences: Coherence of mind.—AAIs were collected with the first generation MLSRA participants at ages 19 and 26 years. As previously discussed, the AAI is semi-structured interview that elicits narrative recollections of experiences with caregivers before age 13 years. AAIs at both ages were coded using the most recent versions of Main and Goldwyn system available at the time of coding (1984-1998). In the present study, we focus on the 9-point overall coherence of mind ratings at both age 19 and 26 years. Higher coherence of mind scores are assigned to AAI narrative deemed to be internally consistent, detailed, plausible, and not emotionally overwrought (see Hesse, 2016 for detailed discussion of the coding system). Coherence of mind assessed via the AAI is believed to indicate the organization of an individual's attachment representation, with higher coherence of mind ratings being associated with a secure attachment representation. AAI security has demonstrated good reliability, stability, and discriminant validity (e.g., Bakermans-Kranenburg & Van IJzendoorn, 1993; Crowell et al., 1996). Moreover, AAI coherence of mind has been associated with participants' maternal sensitivity experienced during childhood (e.g., Steele et al., 2014), romantic relationship functioning (e.g., Crowell et al., 2002; Holland & Rosiman, 2010), and the quality of parenting in adulthood (e.g., Van IJzendoorn, 1995). All AAIs were coded by trained and certified reliable coders, and intraclass correlations (ICCs) for the age 19 and 26 year coherence of mind ratings were .83 and .87, respectively. AAI coherence of mind scores were composited across the two ages in order to provide a more reliable estimate of the construct across early adulthood and to maximize sample size ($r = .36, p < .001$, Cronbach's $\alpha = .53$).

Schematic representations of early caregiving experiences: Secure base script knowledge.—In addition to the traditional AAI coding system described above,

AAIs were also coded for secure base script knowledge using the secure base script coding system (AAI_{sb}; Waters & Facompré, in press; Waters et al., 2017). Within this system, the first six questions of the AAI are coded with a 9-point scale to identify the extent to which the interview narratives follow or imply the presence of a secure base script. Coders focus on content that explicitly or implicitly communicates expectations consistent with a secure base script (e.g., caregiver availability, responsiveness, or provision of effective comfort), as well as specific autobiographical memories that follow the secure base script. A score of 9 indicates a secure base script structure followed by several specific event narratives; a score of 4 indicates the narratives contain numerous expectations consistent with secure base script knowledge but no specific event narratives were organized around the script; and a score of 1 reflects several specific scenes that directly violate secure base script structure (e.g., child signaled for help, but was rejected and help was not offered) and may also reflect alternative relationship expectations (e.g., recurring abuse). Unlike the AAI coherence of mind score, the AAI secure base script score makes no attempt to evaluate clarity, brevity, or any other linguistic markers of coherence (see Waters et al., 2017, for additional details).

The AAIs were coded for secure base script knowledge by two trained and reliable coders, with 54% of the 19 year AAIs and 55% of the 26 year AAIs double coded. The remaining AAIs were coded by a single coder. The secure base coders were not formally trained or certified to code the AAI using the traditional coding system, and had not participated in the original coding of the AAIs in the MLSRA. ICCs for the 19 year and 26 year AAI_{sb} scores were .83 and .82, respectively. All coder disagreements were resolved through consensus. AAI_{sb} scores were composited across the two ages to provide a more reliable estimate of secure base script knowledge across early adulthood and to maximize sample size ($r = .55$, $p < .001$, Cronbach's $\alpha = .71$).

Measures: Romantic Relationship Functioning

Observed quality of interaction with romantic partners.—A subset of the MLSRA target participants in romantic relationships completed two structured interactions: one focused on resolving a conflict in the relationship for approximately 10 minutes (Cox, 1991) and another in which partners were asked to collaborate to complete an “ideal couple” task (Collins et al., 1999) with their romantic partners at ages 20-22 ($M = 20.7$, $SD = 0.6$), 22-24 ($M = 23.1$, $SD = 0.5$), or 26-29 ($M = 27.0$, $SD = 0.8$) years ($N = 98$ unique cases). Participants not involved in romantic relationships were excluded from these tasks. Trained coders rated the observed quality of the interaction on a scale from 1 to 7 from videotapes of participants' interactions with their romantic partners. Higher scores represented a more supportive relational interaction in the dyad, whereas low scores either represented a general lack of support or contrasting negative features (e.g., victimization, chronic intense conflict, and rigidity of roles). Strong inter-rater reliability was found for overall quality ratings: ICC = .92 (19 double coded cases) for the age 20-22 assessment, ICC = .93 (12 double coded cases) for the age 22-24 assessment, and ICC = .79 (35 double coded cases) for the age 26-29 assessment. In order to maximize sample size across assessments, observed quality ratings were averaged across the three assessments to create a composite measure of overall observed romantic relationship quality during early adulthood (Cronbach's $\alpha = .79$).

Relationship satisfaction.—Self-reported relationship quality was assessed via the Relationship Assessment Scale (RAS; Hendrick, 1988; Hendrick, Dicke, & Hendrick, 1998) during the same assessment waves as the observational data (i.e., ages 20-22, 22-24, and 26-29 years; $N = 111$ unique cases). The RAS is a self-report questionnaire utilizing seven items to assess how satisfied partners feel in their romantic relationship (e.g., “how well does your partner meet your needs?”; “how good is your relationship compared to most?”). Higher scores represent greater perceived relationship quality and satisfaction. RAS items were averaged to create total scores within each assessment period (Cronbach’s $\alpha = .82, .84, .89$, respectively), and then total RAS scores were averaged across assessments in order to maximize sample size and create a variable representing average romantic relationship satisfaction throughout early adulthood. This composite variable showed strong internal consistency (Cronbach’s $\alpha = .84$).

Effectiveness of romantic engagement.—At age 32 years, 164 MLSRA target participants completed semi-structured interviews developed by the MLSRA team which focus on participants’ current romantic relationships and relationship histories. Trained coders listened to audiotapes of interviews and rated the degree to which participants demonstrated effectiveness in romantic relationship engagement appropriate to the age of assessment. Interviews were coded on a 5-point scale with higher scores indicating relationship histories featuring mutual caring, trust, and emotional closeness; concern for, and sensitivity to, the needs and wishes of others; sharing of experiences and enjoyment with others; and valuing faithfulness, loyalty, and honesty. Lower scores reflected either a lack of these characteristics, or the participant’s inability to maintain romantic relationships for more than a short period of time. Ratings showed strong inter-rater reliability ($ICC = .94$). At the time of this interview, 38% of the participants were married, 9% were engaged, 10% were dating and cohabitating, 21% were dating but not living together, 1 participant (1%) was in a romantic relationship but did not specify the type, and 21% were not involved in a romantic relationship.

Interview-based ratings of effectiveness of romantic engagement were also completed at age 23 for 162 participants in the analytic sample. Thirty-five cases were double-coded, and the ratings showed strong inter-rater reliability ($ICC = .93$). At the time of the age 23 interview, 12% of the participants were married, 11% were engaged, 21% were dating and cohabitating, 25% were dating but not living together, and 32% were not involved in a romantic relationship. Interview-rated effectiveness of romantic engagement at age 23 years was included as a covariate only for the analyses predicting effectiveness of romantic engagement at age 32 years. Controlling for effectiveness of romantic engagement around the time of the assessments of attachment representations allowed for stronger inferences about the direction of effects when predicting romantic effectiveness at age 32 years

Measures: Parent-child Relationship Functioning

Infant attachment.—Beginning in adolescence, 57 female participants (G1) completed an assessment of infant attachment security with their children (G2) using the Strange Situation procedure (Ainsworth, Blehar, Waters, & Wall, 1978). At the time of this assessment, target participants’ ages ranged from age 16 to 38 years ($M = 24.4, SD = 5.3$), and the infants’

(G2) ages were between 12 and 21 months ($M = 13.9$, $SD = 2.0$). Infants' behaviors were videotaped and coded using the interactive behavior ratings for proximity seeking, contact maintenance, attachment avoidance, and resistance. Infants were then classified according to the organized patterns of securely attached (70%), insecure-avoidant (19%), or insecure-resistant (9%). One case (2%) could not be classified as consistent with one of the organized patterns. Attachment disorganization was rated using the 9-point infant attachment disorganization/disorientation scale, and infants were classified as disorganized if they received a score of 5 or higher (28%). Eleven cases were double-coded by two expert coders for reliability purposes. Interrater agreement was 72% ($\kappa = .58$) for the three organized categories and 100% ($\kappa = 1.00$) for disorganization classifications in the reliability set. Analyses focused on the two-way classification system of secure v. insecure. All infants classified as either disorganized or cannot classify were considered insecurely attached for the present analyses. As a result, 58% of the G2 infants had a primary classification of secure, and 42% had a primary classification of avoidant, resistant, disorganized, or cannot classify.

Observed parenting quality.—The MLSRA G1 male and female participants were observed interacting with their children at the ages of 24 and 42 months old ($N = 97$ unique cases). At both ages, parent-child dyads were observed in a laboratory setting while attempting to solve a series of problem-solving tasks that were designed to increase in complexity until it was too difficult for the child to complete the task without parental support and assistance. Videos of the assessment were coded for observed parenting quality using several 7-point scales. As described by Shlafer et al. (2015), principal component analyses of the various 7-point parenting quality ratings identified an “observed supportive parenting” component at each age (24 month: supportive presence, quality of assistance, and reverse-scored hostility; 42 month: supportive presence, respect for autonomy, and reverse-scored hostility). ICCs were based on a sample of 35 cases for the 24 month assessment and 59 cases for the 42 month assessment and were between .68 and .86 for all ratings. Composite measures of supportive parenting were created at each age by averaging the relevant indicators (Cronbach's α s = .84 and .87 at 24 months and 42 months, respectively). Given the stability of the supportive parenting measures across the two assessments ($r = .58$), and to maximize sample size, an average of the 24-month and 42-month supportive parenting composites was used for the present analyses. In cases where parents completed the two parenting assessments with different children ($n = 7$), data from the assessment completed with the eldest child were used in the analyses. Adult participants' ages at the time of the observed parenting assessments were between 21 and 37 years ($M = 26.9$, $SD = 4.1$).

Interview-rated parenting quality.—At age 32 years, 113 participants (46% male) reported serving in a parental role and thus completed a semi-structured interview designed to assess individual's parenting attitudes, beliefs, and practices. An additional four participants reported being biological parents but were excluded from analyses because they did not have regular contact with any of their children. Participants reported providing regular parental care to between one and 11 children ($M = 2.5$, $SD = 1.6$) with those children's ages ranging from two months to 21 years ($M = 7.5$ years, $SD = 4.4$ years).

In the interview, participants were asked to describe the ideal parent–child relationship and then to supply examples of their own parenting behaviors to support their stated views. Parents were also asked to describe their own parenting experiences in providing support, affection, and setting limits. Each interview was audio recorded and coded using six 7-point rating scales: Positive Emotional Connectedness (warmth toward children and pleasure in being a parent), Parental Investment/Involvement (belief in the importance of being a parent and a clear commitment to parenting), Parental Confidence (sense of efficacy in the parental role), Hostile Parenting (derogation or rejection of children), Parent-Child Boundary Dissolution (role-reversal in the parent–child relationship), and Coherence of Parenting Philosophy (organization and consistency of the parents’ various parenting beliefs and practices). Ratings for all participants were completed by at least two independent coders, and ICCs for all scales ranged from .81 to .93.

As described by Shlafer et al. (2015), a principal components analysis of the parenting interview ratings indicated that a two-component model accounted for the variability in the parenting interview ratings reasonably well. Supportive Parenting included positive emotional connectedness, parental investment/involvement, and coherence of parenting philosophy (Cronbach’s $\alpha = .88$). Negative Parenting included only two scales (hostile parenting and parent–child boundary dissolution) and the internal consistency was low (Cronbach’s $\alpha = .49$); for these reasons, the present analyses only focus on the Supportive Parenting composite.

Measures: Covariates

As noted above, interview-rated effectiveness of romantic engagement at age 23 years was included as a covariate only for the analyses predicting effectiveness of romantic engagement at age 32 years, as this allowed for testing whether adults’ attachment representations predicted romantic engagement at a later age after controlling for the roughly contemporaneous association between the AAI variables and age 23 romantic relationship effectiveness. In addition, we included four control variables consistently used in recent analyses of the MLSRA cohort (e.g., Raby, Labella, Martin, Carlson, & Roisman, 2017; Waters et al., 2017) when predicting all six romantic relationship and parent-child relationship outcomes. These included the MLSRA target participants’ biological sex (male = 1; female = 2), ethnicity (1 = White/non-Hispanic; 0 = other; children with unknown paternal ethnicity were classified based on maternal ethnicity), childhood socioeconomic status (SES), and childhood maternal education. SES was measured using the Duncan Socioeconomic Index (Stevens & Featherman, 1981), and a composite was created by averaging the information collected at seven time points (42 months, 54 months, grade 1, grade 2, grade 3, grade 6, and age 16 years). Maternal education (i.e., number of years of schooling) was collected seven times across the study (3 months prior to the target child’s birth, 42 months, grade 1, grade 2, grade 3, grade 6, and age 16 years), and a composite was created by averaging scores. Because the second-generation infant attachment security assessments were only completed with female G1 participants, biological sex was not included as a covariate in the models predicting infant attachment security.

Results

Preliminary Analyses

Descriptive statistics and zero-order correlations are presented in Table 1. As reported by Waters et al. (2017), there was a positive correlation between the independent ratings of adults' overall coherence of mind and secure base script knowledge during the AAI. Consistent with prior reports from the MLSRA (Haydon, Collins, Salvatore, Simpson, & Roisman, 2012; Raby, Steele, Carlson, & Sroufe, 2015; Roisman, Collins, Sroufe, & Egeland, 2005; Shlafer et al., 2015), AAI coherence of mind was positively associated with observational and interview-based ratings of supportive romantic and parent-child relationships. However, AAI coherence of mind was not significantly associated with self-reported romantic relationship satisfaction or with infant attachment security in G2. The latter result parallels the non-statistically significant estimate of the intergenerational transmission of attachment security based on AAI classifications from the MLSRA sample ($r = -.04$) reported in a recent meta-analysis (Verhage et al., 2016). In contrast, secure base script knowledge was positively associated with infant attachment security in the next generation, the observational (but not interview) ratings of supportive parenting, and all three romantic relationship quality variables.

Strategy for Focal Analyses

The unique associations between adults' scripted and autobiographical attachment-related representations and their romantic and parent-child relationship outcomes were evaluated using a set of hierarchical linear regression analyses (Table 2 and Table 3). For each model, the initial step included the covariates discussed above. Next, two different versions of the second step were evaluated: one for coherence of discourse (Step 2a) and another for secure base script knowledge (Step 2b). These analyses tested whether adults' attachment-related representations were associated with relationship functioning after accounting for the covariates. In the final step, adults' secure base script knowledge *and* coherence of discourse during the AAI were simultaneously entered to evaluate whether each attachment construct had unique associations with the relationship outcome of interest.

Effect sizes were represented by standardized regression coefficients and are interpreted using Cohen's (1992) definitions of small, medium, and large effect sizes ($r = .10$, $r = .30$, and $r > .50$, respectively). Raw and adjusted R^2 estimates are presented for each step of the models. The change in R^2 estimates can be derived by subtracting the R^2 estimate for the more basic model from the more complex one (e.g., subtracting the R^2 estimate from step 1 from the R^2 estimate for step 2a or step 2b). Because each step only includes one new variable, the significance of the R^2 change is equal to the statistical significance of the standardized regression coefficient for the newly added variable at each step. The analyses below present results for the changes in the raw R^2 values, with changes in adjusted R^2 values included in parentheses.

To address missing data for the romantic and parent-child relationship outcomes, all analyses used full-information maximum likelihood (FIML), which produces less biased and more consistent parameter estimates than listwise deletion, even when a large percentage of

cases are missing data (Graham, 2009). One regression model was conducted for the three romantic relationship outcomes, and another regression model was conducted for the three parent-child relationship outcomes. All models were run using *Mplus* (Muthén & Muthén, 1998-2017). Within each model, the various outcome variables were allowed to correlate. Of note, conclusions about the statistical significance of the associations between adults' attachment representations and parent-child and romantic relationship functioning did not differ when listwise deletion was used (see supplemental materials).

Across the participants, there was variability in the temporal lag between the AAI assessments and several of the outcome variables because: (a) we created composites of observed and self-reported romantic relationship quality based on information collected at multiple time-points during adulthood and (b) participants' ages varied at the time of the infant attachment and observed parenting quality assessments. For all participants, the AAI temporally preceded the interview-based assessments of romantic relationship effectiveness and parenting quality completed at age 32 years. The temporal lag between the AAI assessments (either at age 19 only, age 26 only, or the average age of 22.5) and timing of each assessed outcome did not significantly moderate any of the associations between attachment representations and the outcome variables examined here.

Romantic Relationship Functioning

Observed quality of interaction with romantic partners.—As reported in Table 2, both AAI coherence of mind and secure base script knowledge had small to medium associations with observed relationship quality after controlling for demographic variables (Step 1 to Step 2a $R^2 = .08$ ($adjR^2 = .08$), $p < .01$; Step 1 to Step 2b $R^2 = .04$ ($adjR^2 = .04$), $p = .02$). However, when the two variables were entered simultaneously in Step 3, only coherence of mind predicted unique variance in observed romantic relationship quality (Coherence: Step 2b to Step 3 $R^2 = .05$ ($adjR^2 = .05$), $p = .01$; Secure base script: Step 2a to Step 3 $R^2 = .01$ ($adjR^2 = .01$), $p = .22$). This suggests that AAI coherence has a significant association with observed romantic relationship functioning after accounting for secure base script knowledge and covariates.

Relationship satisfaction.—Secure base script knowledge was significantly associated with self-reported relationship satisfaction after controlling for demographic variables (Step 1 to Step 2b $R^2 = .03$ ($adjR^2 = .03$), $p = .02$); however, this was not the case for AAI coherence (Step 1 to Step 2a $R^2 = .01$ ($adjR^2 < .01$), $p = .16$). Neither secure base script knowledge or AAI coherence was uniquely associated with reported relationship satisfaction after accounting for the other attachment representation variable (Coherence: Step 2b to Step 3 $R^2 = < .01$ ($adjR^2 = -.01$), $p = .51$; Secure base script: Step 2a to Step 3 $R^2 = .02$ ($adjR^2 = .02$), $p = .06$). These results suggest that neither attachment representation significantly accounted for unique variance in romantic relationship satisfaction over and above the other.

Effectiveness of romantic engagement.—Interview ratings of romantic relationship effectiveness were not significantly associated with script knowledge or AAI coherence after the inclusion of demographic variables and romantic effectiveness at age 23 (Coherence:

Step 1 to Step 2a $R^2 < .01$ ($adjR^2 < .01$), $p = .25$; Secure base script: Step 1 to Step 2b $R^2 = .02$ ($adjR^2 = .02$), $p = .06$). In addition, neither variable was uniquely associated with romantic engagement over and above the other measure of adult attachment representations and covariates (AAI coherence: Step 2b to Step 3 $R^2 < .01$ ($adjR^2 = -.01$), $p = .49$; Secure base script: Step 2a to Step 3 $R^2 = .02$ ($adjR^2 = .01$), $p = .08$). This suggests that neither attachment variable is uniquely associated with interview-rated romantic relationship functioning.

Parent-Child Relationship Functioning

Infant attachment security.—As reported in Table 3, secure base script knowledge (but not AAI coherence) was associated with infant attachment security in the next generation, even after controlling for demographic variables (Coherence: Step 1 to Step 2a $R^2 < .01$ ($adjR^2 < .01$), $p = .86$; Secure base script: Step 1 to Step 2b $R^2 = .20$ ($adjR^2 = .15$), $p < .01$). In addition, secure base script knowledge was uniquely associated with infant attachment even when AAI coherence was added to the model along with demographic variables (Step 2a to Step 3 $R^2 = .21$ ($adjR^2 = .16$), $p < .01$). In contrast, AAI coherence was not associated with infant attachment when secure base script knowledge was added to the model (Step 2b to Step 3 $R^2 = .01$ ($adjR^2 = .01$), $p = .46$). The magnitude of the association between adults' secure base script and infant attachment in the next generational was medium to large.

Observed parenting quality.—Neither AAI coherence nor secure base script knowledge was significantly associated with observed parenting quality after the inclusion of demographic covariates (Coherence: Step 1 to Step 2a $R^2 = .03$ ($adjR^2 = .02$), $p = .05$; Secure base script: Step 1 to Step 2b $R^2 < .01$ ($adjR^2 = -.01$), $p = .79$) or when considering both demographic covariates and the other form of attachment representation (Coherence: Step 2b to Step 3 $R^2 = .03$ ($adjR^2 = .02$), $p = .05$; Secure base script: Step 2a to Step 3 $R^2 < .01$ ($adjR^2 = -.01$), $p = .78$). These data indicate that neither form of attachment representation was uniquely associated with observational ratings of parenting quality.

Interview-rated parenting quality.—Similar to the findings for observed parenting quality, neither AAI coherence nor secure base script knowledge was significantly associated with interview-rated parenting quality after the inclusion of demographic covariates (Coherence: Step 1 to Step 2a $R^2 = .03$ ($adjR^2 = .02$), $p = .05$; Secure base script: Step 1 to Step 2b $R^2 < .01$ ($adjR^2 = -.01$), $p = .75$). When examining if either form of attachment representation was uniquely associated with variance in interview-rated parenting quality, results indicated a statistically significant association between AAI coherence and interview-rated parenting quality when controlling for demographics and secure base script knowledge (Step 2b to Step 3 $R^2 = .04$ ($adjR^2 = .03$), $p = .03$). In contrast, secure base script knowledge's association with interview-rated parenting quality was not statistically significant after the inclusion of covariates and AAI coherence (Step 2a to Step 3 $R^2 = .01$ ($adjR^2 < .01$), $p = .33$). These results indicate that AAI coherence is uniquely associated with interview-rated parenting quality even when factoring in an individual's secure base script knowledge.

Discussion

The overarching purpose of the present study was to evaluate whether secure base script knowledge was associated with functioning in adult romantic relationships and parent-child relationships using multi-method assessments in a high-risk, prospective, longitudinal sample. In addition, we also leveraged available data on adults' autobiographical representations of childhood caregiving experiences to evaluate the extent to which each form of attachment representation is uniquely associated with these relationship outcomes. The bivariate correlations we observed replicated recent findings indicating that secure base script knowledge is positively associated with adults' functioning in romantic relationships (Waters et al. 2013), adults' supportive parenting during interactions with their children (e.g., Coppola et al., 2006), and infant attachment quality in the next generation (e.g., Bost et al., 2006). Because previous research on the interpersonal outcomes associated with adults' secure base script knowledge has exclusively focused on normative-risk samples, the potential impact of higher risk developmental contexts (e.g., poverty) on the associations between script knowledge and the quality of romantic and parent-child relationships was previously unknown. Our results from the higher risk MLSRA sample suggest that secure base script knowledge is correlated with romantic and parent-child relationship quality in a theory-consistent manner, even in the face of early adversity.

The results of regression analyses suggest that the scripted and autobiographical forms of attachment representations are associated in *unique* ways to different relationship functioning outcomes. Specifically, secure base script knowledge was uniquely associated with the security of the parent-infant dyad, whereas AAI coherence of mind was uniquely associated with observations of romantic relationship functioning and interview ratings of supportive parenting. Importantly, secure base script knowledge was no longer significantly associated with observed supportive parenting after accounting for covariates and autobiographical attachment representations. Taken together, these results suggest that secure base script knowledge is not merely "old wine in a new bottle." Rather, scripted and autobiographical attachment representations appear to uniquely account for different aspects relationship functioning. It is important, however, to note that substantial overlap in terms of predictive significance exists between the two constructs as well (see Waters et al., 2013; Bosmans & Kerns, 2016 for discussion of this issue).

In accounting for the unique association between the secure base script and infant attachment, it is worth noting that the script contains clear details or expectations surrounding the provision of support during times of distress (e.g., physical injury) and quickly returning the attached individual to meaningful engagement with the environment. The measure of infant attachment used here, i.e. The Strange Situation Procedure, is a behavioral analogue to the types of experiences that are believed to be reflected in a secure base script (i.e., clear distress in the child with parent readily available to respond). As a result, secure base script knowledge may be more influential in shaping parental responses to infant distress in these contexts, which in turn is instrumental in shaping the infants' early attachment expectations of availability and responsiveness (i.e., attachment security).

In contrast, AAI coherence of mind may be more influential in shaping support in the context of exploration, or when the attached individual's needs are more varied such as during the romantic interaction task used in the current study. The autobiographical memories recalled during the AAI interview often contain content related to warmth, affection, and encouragement (or lack thereof) that extend beyond specific secure base interactions. Thus, adults' autobiographical memories may contain more context specific information, rather than generalizations like the secure base script, and thus serve as a better heuristic for guiding behavior during these types of interactions.

Unlike the links between secure base script knowledge and infant attachment, links between secure base script knowledge and romantic relationship outcomes proved to be less robust, with effects dropping out of the range of statistical significance at $p < .05$. The observed effect sizes for associations between secure base script knowledge and both self-reported and interview rated romantic relationship functioning were small but worth exploring in future research. The same is true for the unique association between AAI coherence and observed parenting quality. Larger sample work could more conclusively evaluate the unique links, if any, between attachment representations and these assessments of relationship functioning.

Altogether, the findings from this study are consistent with the hypothesis that attachment representations are associated with functioning in the salient interpersonal contexts of adulthood. Rather than being redundant measures of the same underlying construct, the current study provides evidence that these two forms of attachment representations account for common and unique variance in relationship functioning. A critical next step will be evaluating—using prospective, longitudinal data with large samples— if and how these attachment representations differentially mediate the long-term associations between childhood caregiving experiences and adults' functioning in romantic and parent-child relationship contexts. Due to the variability of measures included at each assessment point, we were unable to entirely disentangle the temporal components of the relations we observed (e.g., does script knowledge promote security in the next generation or does having a securely attached infant enhance secure base script knowledge?). Instead, we opted to composite measures to assess mean levels of the quality of adults' attachment representations or relationship functioning whenever possible. Future research would be well served to investigate issues related to stability and change in attachment representations and relationship outcomes to help disentangle the direction of effects reported here and elsewhere.

Our understanding of the precise ways attachment representations may influence adults' thoughts, feelings, and behaviors in close relationships remains limited. Data show that cognitive scripts impact the interpretation of novel information, guide attention, and influence memory retrieval and reconstruction (Abbott, Black, & Smith, 1985; Abelson, 1981; Bargh, 1996; Markman, 1999; Reiser, Black, & Abelson, 1985; Schank & Abelson, 1977). In the same vein, autobiographical representations are argued to serve three basic functions: self-definition, fostering social connection, and directing decision-making and behavior (e.g., Bluck & Alea, 2008; Fivush & Waters, 2013; Waters, Bauer, & Fivush, 2014). Furthermore, Main (2000) hypothesized that secure autobiographical representations

of childhood caregiving experiences (assessed by AAI coherence of mind) reflect an underlying attentional style that develops in response to the quality and consistency of care received during childhood.

Research into the associations between both forms of attachment representation and these more specific cognitive processes may elucidate the pathways by which attachment representations exert their influence on adults' functioning in romantic and parent-child relationships. Attachment-related information processing biases have already proved useful in understanding relationship functioning (Dykas & Cassidy, 2011). These cognitive processes may also be a useful target in intervention efforts (e.g., De Winter, Bosmans, & Saleminck, 2017). That said, how these cognitive processes are differentially related to AAI coherence and/or the secure base script remains an open question. Understanding these links may further our understanding of why the secure base script and AAI coherence, in some cases, are uniquely associated with relationship functioning, but in others significantly overlap.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Correlations and Descriptive Statistics for the Variables for Adults' Attachment Representations, Parent-Child Relationship Functioning, and Romantic Relationship Functioning

Table 1

	1	2	3	4	5	6	7	8
1. AAI SBSK	—							
2. AAI coherence of mind	.33*	—						
3. Observed romantic relationship quality	.27*	.31*	—					
4. Self-reported romantic relationship satisfaction	.24*	.14	.35*	—				
5. Interview ratings of romantic relationship effectiveness	.23*	.25*	.35*	.34*	—			
6. Second generation infant attachment security	.38*	.08	.27*	.20*	.04	—		
7. Observed supportive parenting	.17*	.26*	.26*	.13	.26*	.25*	—	
8. Interview-based supportive parenting	.09	.24*	.41*	.25*	.47*	.01	.40*	—
<i>M or %</i>	3.33	4.16	4.41	5.80	3.48	58%	5.17	5.17
<i>SD</i>	1.30	1.50	1.39	0.80	1.33	—	0.98	1.18

Note: N = 178.

* $p < .05$.

AAI = Adult Attachment Interview. SBSK = secure base script knowledge.

Associations between Adults' Attachment Representations and their Romantic Relationship Outcomes

Table 2.

	Outcome: Observed relationship quality					Outcome: Self-reported relationship quality					Outcome: Interview ratings of romantic effectiveness				
	β	SE	p	R ² (adj.)	p	β	SE	p	R ² (adj.)	p	β	SE	p	R ² (adj.)	p
<i>Step 1</i>				.17 (.13)	.03				.11 (.08)	.03				.22 (.19)	<.01
Maternal education	.23	.10	.03			-.07	.10	.54			.05	.09	.57		
Socioeconomic status	.01	.10	.89			-.05	.10	.60			.20	.09	.02		
Ethnicity	.30	.09	<.01			.30	.08	<.01			.06	.07	.42		
Biological sex	.14	.09	.11			.11	.09	.20			-.01	.07	.89		
Effectiveness at age 23	-	-	-			-	-	-			.36	.08	<.01		
<i>Step 2a</i>				.25 (.21)	<.01				.12 (.08)	.02				.22 (.19)	<.01
AAI coherence	.27	.08	<.01			.12	.08	.16			.10	.08	.25		
Maternal education	.21	.10	.04			-.07	.10	.51			.05	.09	.56		
Socioeconomic status	.00	.10	.99			-.07	.10	.52			.19	.09	.04		
Ethnicity	.24	.09	.01			.27	.08	<.01			.05	.07	.51		
Biological sex	.13	.09	.14			.11	.09	.19			.07	.85			
Effectiveness at age 23	-	-	-			-	-	-			.34	.09	<.01		
<i>Step 2b</i>				.21 (.17)	<.01				.14 (.11)	.01				.24 (.21)	<.01
AAI SBSK	.21	.09	.02			.20	.09	.02			.15	.08	.06		
Maternal education	.20	.10	.06			-.10	.10	.35			.02	.07	.74		
Socioeconomic status	.01	.10	.92			-.06	.10	.56			.03	.01	.03		
Ethnicity	.22	.09	.02			.22	.09	.01			.07	.21	.74		
Biological sex	.17	.09	.06			.13	.09	.12			-.02	.19	.91		
Effectiveness at age 23	-	-	-			-	-	-			.35	.08	<.01		
<i>Step 3</i>				.26 (.22)	<.01				.14 (.10)	.01				.24 (.20)	<.01
AAI SBSK	.12	.10	.22			.18	.10	.06			.13	.08	.08		
AAI coherence	.23	.09	.01			.06	.09	.51			.05	.07	.49		
Maternal education	.19	.10	.06			-.10	.10	.36			.03	.07	.72		
Socioeconomic status	.00	.10	.99			-.06	.10	.53			.02	.01	.04		
Ethnicity	.21	.09	.02			.22	.09	.02			.06	.21	.77		
Biological sex	.14	.09	.10			.13	.09	.12			-.03	.19	.89		

	<u>Outcome: Observed relationship quality</u>			<u>Outcome: Self-reported relationship quality</u>			<u>Outcome: Interview ratings of romantic effectiveness</u>			
	β	SE	p	R^2 (adj.)	p	β	SE	p	R^2 (adj.)	p
Effectiveness at age 23	-	-	-	-	-	.33	.09	<.01		

Note: $N=178$. AAI = Adult Attachment Interview. SBSK = secure base script knowledge. Biological sex was coded as 1 for male and 2 for female. Ethnicity was coded as 1 for non-Hispanic White and 0 for non-White. Romantic effectiveness at age 23 was only included when predicting effectiveness of romantic engagement, as this allowed for controlling for the temporal stability in romantic relationship effectiveness from age 23 to age 32 years.

Table 3. Associations between Adults' Attachment Representations and their Parent-Child Relationship Outcomes

	Outcome: Infant attachment quality					Outcome: Observed supportive parenting					Outcome: Interview ratings of supportive parenting				
	β	SE	<i>p</i>	R^2 (adj.)	<i>p</i>	β	SE	<i>p</i>	R^2 (adj.)	<i>p</i>	β	SE	<i>p</i>	R^2 (adj.)	<i>p</i>
<i>Step 1</i>				.03 (.02)	.73				.14 (.10)	.03				.10 (.07)	.08
Maternal education	.03	.17	.87			.17	.13	.21			.15	.13	.26		
Socioeconomic status	.13	.20	.52			.19	.12	.12			.23	.12	.07		
Ethnicity	-.07	.13	.58			.26	.09	.01			.11	.09	.21		
Biological sex	-	-	-			.07	.10	.49			.11	.09	.23		
<i>Step 2a</i>				.03 (.02)	.85				.17 (.12)	.01				.13 (.09)	.03
AAI coherence	.03	.15	.86			.19	.10	.05			.18	.10	.05		
Maternal education	.03	.17	.88			.17	.13	.20			.15	.13	.23		
Socioeconomic status	.12	.21	.56			.16	.13	.21			.18	.13	.15		
Ethnicity	-.08	.13	.56			.23	.09	.01			.09	.09	.35		
Biological sex	-	-	-			.06	.10	.54			.10	.09	.27		
<i>Step 2b</i>				.23 (.17)	.03				.14 (.09)	.04				.10 (.06)	.08
AAI SBSK	.39	.10	<.01			.03	.10	.79			-.03	.10	.75		
Maternal education	-.14	.16	.36			.16	.14	.24			.15	.13	.24		
Socioeconomic status	.14	.18	.43			.19	.13	.13			.23	.12	.06		
Ethnicity	-.15	.12	.22			.25	.10	.01			.12	.09	.19		
Biological sex	-	-	-			.07	.10	.48			.11	.09	.23		
<i>Step 3</i>				.24 (.18)	.05				.17 (.11)	.03				.14 (.09)	.04
AAI SBSK	.41	.10	<.01			-.03	.10	.78			-.10	.10	.33		
AAI coherence	-.10	.13	.46			.19	.10	.05			.21	.10	.03		
Maternal education	-.14	.15	.35			.17	.13	.19			.17	.12	.18		
Socioeconomic status	.18	.18	.33			.16	.12	.21			.19	.12	.13		
Ethnicity	-.13	.12	.25			.24	.09	.01			.10	.09	.25		
Biological sex	-	-	-			.06	.10	.56			.10	.09	.29		

Note: *N* = 178. AAI = Adult Attachment Interview. SBSK = secure base script knowledge. Biological sex was coded as 1 for male and 2 for female. Ethnicity was coded as 1 for non-Hispanic White and 0 for non-White. Because the second-generation infant attachment security assessments were only completed with female participants, biological sex was not included as a covariate in this model. When predicting infant attachment quality, adjusted R^2 was calculated using Cox and Snell's (1989) formula.