Attachment Security in Pregnancy Mediates the Association between Maternal Childhood Maltreatment and Psychopathology in Offspring

By

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To my parents, Marni Jameson Carey and Dan Roth,

who have supported me in pursuing a challenging and meaningful career

and

To my advisor, Kate Humphreys,

for her constant guidance, patience, and encouragement

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INTRODUCTION

The adverse effects of stressful experiences can be transmitted across generations (Bowers & Yehuda, 2016). Severe stress exposure in parents, including experiencing childhood maltreatment, is a risk factor for psychopathology in offspring (Babcock Fenerci & Allen, 2018; Plant et al., 2017). In particular, maternal experiences of maltreatment during childhood are associated with increased rates of offspring emotional difficulties across childhood and adolescence (Min et al., 2013; Myhre et al., 2014; Rijlaarsdam et al., 2014).

Adult attachment is often conceptualized along three dimensions or "attachment styles" drawn from infant–caregiver attachment theory (Ainsworth et al., 1978; Bowlby, 1969): attachment avoidance, attachment anxiety, and attachment security (Hazan & Shaver, 1987, 1990). In this model of adult attachment, adults who identify most strongly with the *avoidant* style feel uncomfortable getting close to or trusting others; those identifying with the *anxious* style worry that close others do not really love them or may leave them; and those identifying with the *secure* style are confident depending on and trusting others (Hazan & Shaver, 1987). Young children exposed to maltreatment have elevated rates of avoidant and anxious attachment in infancy (Cyr et al., 2010). Childhood maltreatment is associated with attachment styles across development (Sroufe, 2005), and attachment styles tend to remain stable into adulthood (Fraley, 2002; Waters, Merrick, et al., 2000; Waters, Weinfield, et al., 2000). There is evidence that caregivers' attachment style during their child's early life may affect child development; avoidant attachment in mothers has been associated with developmental delay in infants (Alhusen et al., 2013).

Interdisciplinary research efforts in humans have mapped potential pathways from mothers' childhood maltreatment history to offspring outcomes. Some evidence supports the

formulation that maternal attachment in adulthood mediates the association between mothers' history of maltreatment in childhood and offspring psychopathology. Adult attachment style has been suggested to mediate the effects of early life adversity on risk for psychopathology in adults (Bifulco et al., 2006; Widom et al., 2018), but has not been examined as a mediator of the association between mother's history of childhood maltreatment and symptoms of psychopathology in offspring. There is, however, precedent for considering mother's attachment security in relation to her child's psychopathology. Results of one study examining maternal attachment insecurity as a mediator of the association between maternal postpartum mental health and child internalizing symptoms indicated that while the mediation was not significant, greater maternal attachment insecurity was associated with increased offspring internalizing symptoms (Reck et al., 2016). These findings suggest that another antecedent maternal experience may influence maternal attachment security and its effect on child psychopathology. Given that maternal maltreatment experiences in childhood are associated with both maternal attachment security (Mickelson et al., 1997) and offspring risk for psychopathology (e.g., Babcock Fenerci & Allen, 2018; Plant et al., 2017), maternal childhood maltreatment is another maternal experience whose effect on offspring psychopathology could be mediated by maternal attachment security.

The current study examined the links among childhood maltreatment severity, adult attachment style, and offspring psychopathology. Using a longitudinal design, we assessed maternal attachment security when women were in their third trimester of pregnancy. Participants were then contacted again after the initial assessment, when their children with whom they were pregnant when they were originally assessed were ages 18 to 72 months, in order to obtain assessments of symptoms of psychopathology in early childhood. Retrospective

report was used to assess the severity of women's exposure to maltreatment during their own childhoods. Based on findings that maternal maltreatment experiences in childhood are associated with offspring psychopathology (Babcock Fenerci & Allen, 2018; Fenerci & DePrince, 2018; Plant et al., 2017) and that maternal adult attachment style is associated with offspring psychopathology in childhood (Reck et al., 2016), we hypothesize that maternal attachment security will mediate the association of maternal childhood maltreatment history with offspring psychopathology. If this hypothesis is supported, our results will be informative in identifying a modifiable treatment target in peripartum women whose offspring are at elevated risk for psychopathology.

METHOD

Participants

Participants were 124 women who were recruited from local obstetric clinics, the Stanford Women's Wellness psychiatric clinic, and through postings in the community between September 2011 and July 2016 during their pregnancy. Participants were, on average, 32.3 years old (*SD* = 4.6 years) at the initial assessment. More than half of the respondents were Caucasian (60%) and had a graduate degree (59%). Of the 124 women in the initial sample, 96 completed a longitudinal follow-up assessment when the child with whom they were pregnant at the initial assessment was between 18 and 72 months of age (*M* child age = 52.6 ± 15.5 months). Additional sample characteristics are detailed in Table 1. All study procedures were approved by the Stanford University Institutional Review Board, and all participants provided informed consent prior to participating.

Table 1. Sample demographics

	Sample with child follow-up data (*N*=96)
Maternal Age at intake *Mean±SD years*	32.32±4.83
Maternal Race\Ethnicity	
Number (percent)	
White	58 (60)
East Asian	13 (14)
South Asian	6 (6)
Hispanic	8 (8)
Black or African American	1 (1)
More than one	10 (10)
Maternal Education	
Number (percent)	
Some college credit, no degree	3 (3)
Trade/technical/vocational training	2 (2)
Associate degree	4 (4)
Bachelor's degree	29 (30)
Graduate degree	57 (59)
Other	1 (1)
Maternal Employment Status	
Number (percent)	
Employed for wages	49 (51)
Self-employed	13 (14)
Out of work but not looking for work	3 (3)
Homemaker	28 (29)
Student	1 (1)
Unable to work	1 (1)
Other	1 (1)

Maternal Marital Status	
Number (percent)	
Single, never married	4 (4)
Married or domestic partnership	89 (93)
Separated	3 (3)
Income	
Number (percent)	
$0-5,000	1 (1)
$30,001-60,000	7 (7)
$60,001-90,000	6 (6)
$90,001-150,000	23 (24)
Greater than $150,000	56 (58)
Maternal Parity	
Number (percent)	
Primiparous (1)	63 (66)
Multiparous (0)	33 (34)
Child Age *Mean±SD years*	4.38±1.29
Child Sex	
Number (percent)	
Male (1)	48 (51)
Female (0)	46 (49)
Child Race\Ethnicity	
Number (percent)	
White	53 (55)
Asian	14 (15)
Hispanic	10 (10)
Black or African American	1 (1)
Native Hawaiian/Pacific Islander	1 (1)
More than one	17 (18)

Procedures

Participants completed an initial session in the third trimester of pregnancy during which they completed a self-report assessment of attachment style (ASQ; Feeney et al., 1994). Beginning in 2017, this cohort was re-contacted to complete an online survey hosted on REDCap (P. A. Harris et al., 2009, 2019). The present analyses focus on mothers' reports of their childhood maltreatment experiences via the Childhood Trauma Questionnaire (CTQ; Bernstein et al., 2003) and reports of the target child's psychopathology via the Child Behavior Checklist (CBCL/1.5-5; Achenbach, 1999; Achenbach & Rescorla, 2000). Participants who did not complete surveys after initial prompts received e-mail reminders and, if necessary, telephone prompts. Twenty-five eligible participants did not respond to invitations to complete the follow-up survey; the final sample is composed of 96 women who completed both the initial assessment and the follow-up survey.

Measures

Attachment Style. The Attachment Style Questionnaire (ASQ; Feeney et al., 1994) is a 40-item self-report questionnaire designed to assess adult attachment. The ASQ yields 5 subscales: "confidence" (8 items); "relationships as secondary" (7 items); "need for affirmation" (7 items); "discomfort with closeness" (10 items); and "preoccupation with relationships" (8 items). Each item is rated on a six-point scale from 1 (totally disagree) to 6 (totally agree). A factor analysis of this measure (Brennan et al., 1998) and recent review of adult attachment measures (Ravitz et al., 2010) indicate that these subscales map onto three dimensions of attachment – secure, anxious, and avoidant– here referred to as "attachment domains." Consistent with this previous work, we took the sum of the "need for affirmation" and "preoccupation with relationships" subscales to create a total score for the anxious attachment

domain and took the sum of the "relationships as secondary" and "discomfort with closeness" subscales to create a total score for the avoidant attachment domain. The score on the "confidence" subscale served as the score for the secure attachment domain. In this sample, the ASQ demonstrated good to excellent internal consistency across domains; Cronbach's alphas were good for the secure and anxious attachment domains (.84 and .87, respectively), and excellent for the avoidant attachment domain (.91).

Maternal Childhood Maltreatment. The Childhood Trauma Questionnaire (CTQ; Bernstein et al., 2003) was used to screen participants for any potential history of childhood abuse and neglect. Mothers rated each item on a five-point Likert scale from 1 (never true) to 5 (very often true). Total maternal childhood maltreatment was a summed score of the following 5 CTQ subscales: emotional abuse; physical abuse; sexual abuse; emotional neglect; and physical neglect (range: 25 to 100, higher scores reflect more maltreatment). This variable was natural log-transformed and outlier scores were winsorized to ±3 standard deviations from the mean in order to normalize the distribution.

Child Psychopathology Symptoms. The Child Behavior Checklist for ages 1.5-5 (CBCL/1.5-5; Achenbach, 1999; Achenbach & Rescorla, 2000) is designed to assess internalizing and externalizing symptoms in children age 18 months through 5 years based on maternal report. Responses were scored using the Achenbach System of Empirically Based Assessment (ASEBA) computer scoring program (Achenbach & Rescorla, 2013; Rescorla, 2005) that yielded a total summed score of all the child problem items (i.e. total child problems t-score). A natural log-transformed version of this outcome variable was used in order to normalize the outcome distribution.

Statistical Analysis

Descriptive statistics were calculated for sociodemographic characteristics for the entire sample (Table 1). Mediation analyses were carried out using SPSS Statistics (v26). We conducted independent mediation models to test whether each attachment domain mediated associations between maternal childhood maltreatment severity and offspring psychopathology (see Figure 1). Lastly, we conducted a single mediation model with all attachment domains included simultaneously to examine the indirect effect of each domain over and above the others.

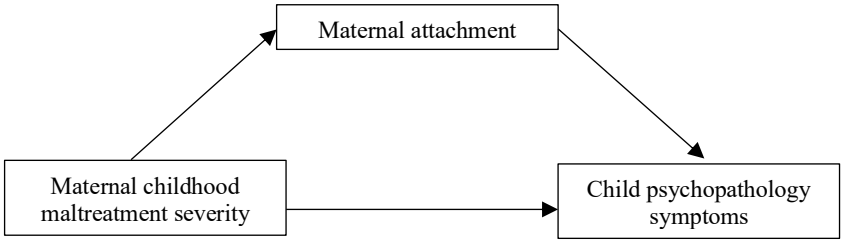

Figure 1. Proposed Mediation Model.

Child age, sex of child, maternal parity, and maternal age were included as covariates on the paths linking maternal childhood maltreatment severity and maternal attachment to child psychopathology symptoms in each of the first three models because these factors may influence the effect of maternal childhood maltreatment on offspring symptoms, but are not likely to influence maternal attachment security given the stability of adult attachment over time (Fraley, 2002; Waters, Weinfield, et al., 2000). Mediation models were tested using PROCESS (Hayes, 2013), a single-step nonparametric resampling procedure (1,000 samples with replacement) for testing indirect effects. To assess the indirect effect, we calculated 95% bias-corrected confidence intervals (CI) of the coefficients. If the 95% CI does not include 0, then the indirect effect is considered statistically significant, supporting mediation.

RESULTS

Correlations

Bivariate correlations among maternal childhood maltreatment severity, attachment scales, child psychopathology symptoms, child age, sex of child, maternal parity, and maternal age are presented in Table 2. Maternal childhood maltreatment severity was significantly positively associated with all three attachment domains and with child total psychopathology symptoms. Secure and anxious attachment, but not avoidant attachment, were significantly associated with child total psychopathology symptoms.

Table 2. Correlations and descriptive statistics for study variables.

	Maternal childhood maltreatment severity[a]	Secure attachment	Anxious attachment	Avoidant attachment	Child total Sx (T-scores)[a]	Child age	Child sex	Maternal parity	Maternal age
Maternal childhood maltreatment severity	1	−.27**	.26**	.25**	.26*	.09	.12	−.01	.19
Secure attachment		1	−.65**	−.58**	−.30**	.34**	.01	−.06	.08
Anxious attachment			1	.52**	.23*	.24*	.11	−.09	−.10
Avoidant attachment				1	.18	−.12	−.02	>−.01	.03
Child total symptoms					1	.14	.10	.01	.06
Child age						1	.17	−.11	.27**
Sex of child (Male=1)							1	.19	.15
Maternal parity (primiparous=1)								1	−.22*
Maternal age									1
Mean (SD) or %	12.08 (12.10)	27.93 (6.21)	33.68 (11.74)	31.15 (13.23)	44.48 (9.84)	4.38 (1.29)	52%	61%	36.67 (4.90)
Range	0-65	8-40	9-69	4-71	28-83	1.61-6.32	0-1	0-1	28-50
N available[b]	91	118	118	118	90	92	91	122	92

Notes: [a]Descriptives included here are based on scores prior to natural log transformation. [b]Sample sizes vary across measures due to reduced participation in the second wave of data collection; some participants not complete all measures in the follow-up survey.
*$p < .05$; **$p < .01$.

Mediation models

Scatter plots depicting the associations between variables entered into the mediation model are presented in Figure 2. Consistent with our hypothesis, the secure attachment domain mediated the relation between maternal childhood maltreatment severity and child psychopathology. We did not find evidence that the anxious attachment or avoidant attachment domains mediated this association. These results are summarized in Table 3.

Table 3. Summary of single-step mediation analyses

Mediator	Direct effect of maternal childhood maltreatment severity	Direct effect on child psychopathology symptoms	Indirect effect
Secure maternal attachment	**-1.77 (-3.05, -0.49)**	**-0.01 (-0.02, >-0.01)**	**0.02 (<0.01, 0.05)**
Anxious maternal attachment	**3.53 (1.01, 6.01)**	0.00 (>-0.01, 0.01)	0.01 (>-0.01, 0.04)
Avoidant maternal attachment	**3.91 (1.13, 8.68)**	0.00 (>-0.01, 0.01)	0.01 (-0.01, 0.04)

Note: Estimate (95% bias corrected bootstrap confidence intervals). Bolded values indicate significant effects.

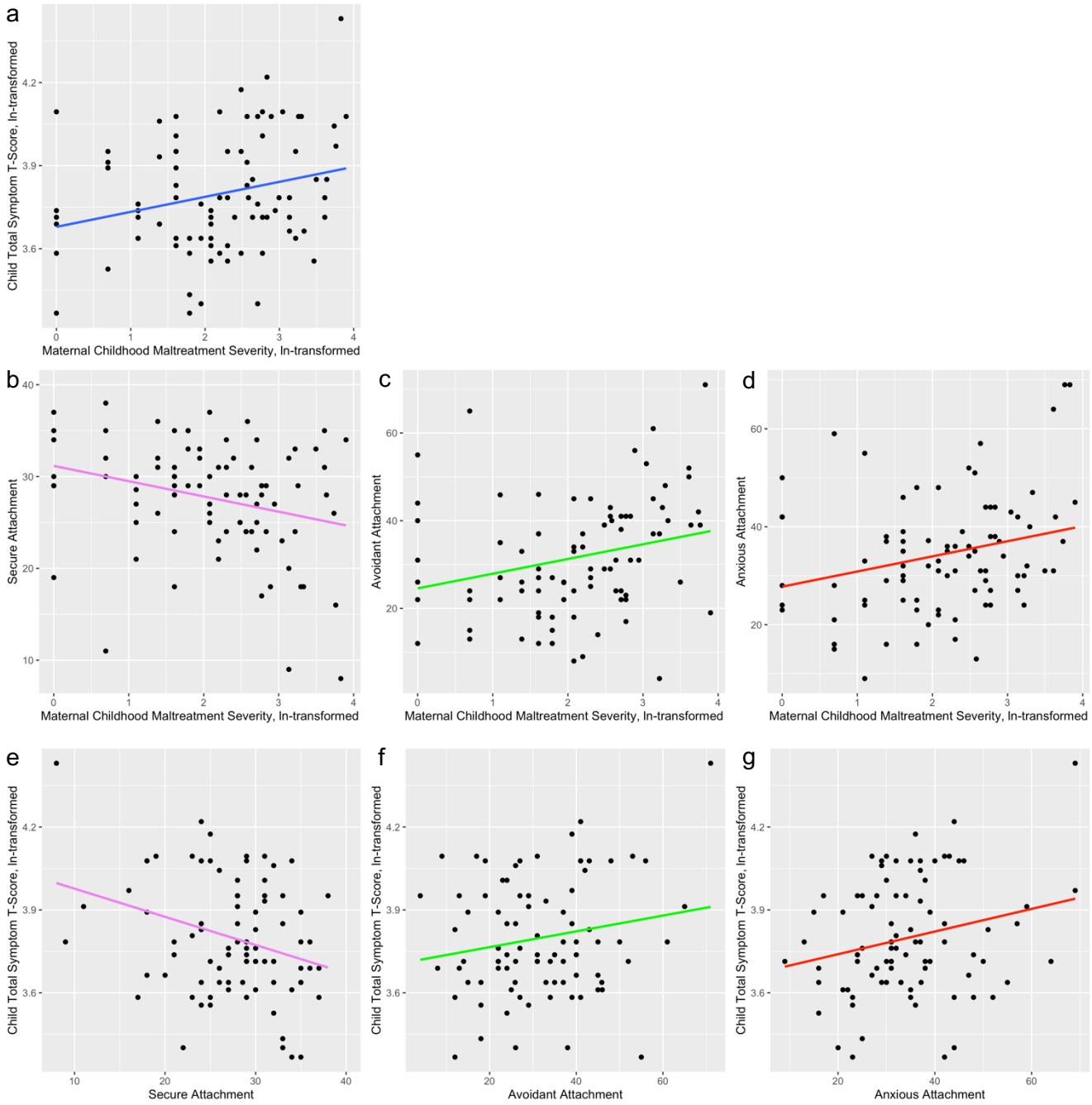

Figure 2. Scatterplots depicting associations between maternal childhood maltreatment severity, child total symptom T-score, and each measured attachment domain. Coefficients of determination for each regression plot: (a) R^2=.07; (b) R^2=.08; (c) R^2=.06; (d) R^2=.07; (e) R^2=.09; (f) R^2=.03; (g) R^2=.05.

Finally, to examine the unique effect of secure attachment relative to the combined effects of the other attachment domains, a multiple mediator model with all attachment domains entered as simultaneous mediators in a single-step mediation with child age, sex of child, maternal parity, and maternal age included as covariates on all paths was conducted. The indirect effect of secure attachment remained significant, even when the anxious and avoidant attachment domains were included as simultaneous mediators. Indirect effects from this multiple mediator model are summarized in Table 4.

Table 4. Summary of mediation analysis with all three attachment domains included.

Mediator	Indirect effect (unstandardized)	Indirect effect (standardized)
Secure maternal attachment	**0.02 (<0.01, 0.05)**	**0.11 (0.01, 0.22)**
Anxious maternal attachment	0.01 (-0.01, 0.03)	-0.03 (-0.12, 0.08)
Avoidant maternal attachment	-0.01 (-0.02, 0.02)	0.04 (-0.04, 0.15)

Note: Estimate (95% bias corrected bootstrap confidence intervals). Bolded values indicate significant effects.

DISCUSSION

In a longitudinal sample of 96 mothers and their offspring, we examined the associations among maternal history of childhood maltreatment, maternal attachment security during pregnancy, and offspring psychopathology in early life. Scores on the secure attachment domain mediated the association between severity of maternal childhood maltreatment and symptoms of psychopathology in offspring. Although severity of maternal childhood maltreatment was associated with maternal anxious and avoidant attachment scores, these attachment domains did not mediate the association with offspring symptoms. Notably, however, when all three attachment domains were included in a multiple mediator model, only secure attachment mediated the association between severity of maternal childhood maltreatment and offspring

symptoms of psychopathology. Consistent with previous work, our results indicate that maltreatment during childhood may have intergenerational effects, given that these experiences were associated with elevated symptoms of psychopathology in the offspring of women who were assessed in pregnancy. Overall, our findings suggest that maternal attachment security may be a useful therapeutic target for improving the outcomes of the children of mothers who experienced childhood maltreatment.

While adult attachment security is relatively stable over time (Fraley, 2002; Waters, Weinfield, et al., 2000) and across the transition to parenthood (Stern et al., 2018), there is evidence that it can be altered by psychotherapeutic interventions (Kilmann et al., 1999; Kirchmann et al., 2012; Travis et al., 2001). Obtaining a measure of maternal attachment security proximal to the transition to parenthood may provide helpful information regarding risk for offspring dysfunction as well as help identify individuals who may benefit from psychotherapeutic or parenting interventions (e.g., Dozier & Bernard, 2017). The foundation for emotional health across the lifespan is formed in early childhood (Britto et al., 2017; Coverdale & Long, 2015; Shonkoff & Phillips, 2000). Given that symptoms of psychopathology emerge as early as toddlerhood (Achenbach, 1999; Petty et al., 2008; Visser et al., 2010), and are stable over time (Hofstra et al., 2002; Mesman & Koot, 2001; Pihlakoski et al., 2006), determining predictors of risk is important for determining approaches to intervention.

Although elucidating the pathway from maternal experiences of childhood maltreatment to offspring psychopathology is useful for identifying potential treatment targets and mother–child dyads who may be at elevated risk for negative outcomes, an unanswered question concerns the mechanisms that link maternal attachment style in pregnancy with subsequent child functioning. Candidate mechanisms include the attachment relationship between the mother and

child, and specific caregiving behaviors provided by the mother. Fraiberg, Adelson, and Shapiro (1975) introduced the metaphor of "ghosts in the nursery," in which parents' past traumas are posited to affect their ability to provide sensitive and responsive caregiving for their infants. Consistent with this theory, empirical evidence suggests that histories of childhood maltreatment and unresolved trauma in mothers is associated with distorted prenatal representations of the infant (Malone et al., 2010), as well as problematic trauma-specific reflective functioning and disorganized infant attachment (Berthelot et al., 2015). Further, a mother's own childhood caregiving experiences may influence her attachment style in ways that affect how she perceives and cares for her child (Crawford & Benoit, 2009; Huth-Bocks et al., 2004). It is important to note that early life experiences, though important, are not likely to be the unique determinants of attachment security. Evidence exists for genetic contributions to attachment style as well (Costa et al., 2009), so future studies may benefit from being genetically informed.

There are alternative and non-mutually exclusive explanations to consider when examining the link between maternal maltreatment history and child symptoms. Parenting practices provide one potential pathway given that maternal exposure to childhood maltreatment is associated with poorer quality mother–child interactions and increased parenting distress (Lang et al., 2010). Another framework suggests that maternal childhood maltreatment severity changes the gestational environment, rendering offspring more vulnerable to psychopathology via biological embedding of life experiences and fetal risk for health and disease (Buss et al., 2017; A. Harris & Seckl, 2011). Consistent with this framework, previous studies have documented the adverse effects of maternal prenatal stress on offspring temperament (Davis et al., 2007), physiology (Gray et al., 2017; Kapoor et al., 2006), and neuroendocrinology (Hartman et al., 2018).

Based on the present findings, it is possible that interventions targeting maternal attachment will improve mental health outcomes in the offspring of women with histories of childhood maltreatment. Further, this work suggests that a focus on increasing attachment security may be more effective than attempts to eradicate anxious or avoidant tendencies. In this context, there are several interventions that may be useful for caregivers of young children, such as the Attachment, Regulation, and Competency framework (ARC; Blaustein & Kinniburgh, 2018) and the Circle of Security intervention (COS; Powell, Cooper, Hoffman, & Marvin, 2016) for parents and children. Given that we found evidence that maternal attachment security during *pregnancy* is important for child functioning, interventions aimed at improving mental health in at-risk offspring should be offered to pregnant women prior to the birth of their child and should focus on adult attachment relationships.

There is evidence that several modalities of adult psychotherapy improve adult attachment security (Fonagy et al., 1996; Kirchmann et al., 2012; Levy et al., 2006; Tasca et al., 2007; Travis et al., 2001). Psychotherapies that have been found empirically to improve adult attachment security include psychodynamic-interpersonal (Fonagy et al., 1996; Tasca et al., 2007; Travis et al., 2001), cognitive-behavioral (Tasca et al., 2007), and integrated (Kinley & Reyno, 2013) approaches. Levy and colleagues (2006) found a significant increase in secure attachment in individuals with borderline personality disorder who were assigned to a group-based transference-focused intervention, but not in individuals who were assigned to a dialectical behavioral therapy or psychodynamic supportive group. Similarly, Kilmann et al. (1999) implemented a brief attachment-focused group intervention with women classified as avoidant or anxiously attached, and found that women who received the intervention reported improved interpersonal relationships, reduced engagement in dysfunctional relationship thinking, and more

secure attachment patterns at 6-month follow-up. Taken together, these findings indicate that increases in attachment security coincide with improvements in interpersonal functioning, a promising domain target for women transitioning to motherhood. Further, there is evidence that activating attachment security via contextual priming increases empathic behaviors and inhibits personal distress (Mikulincer et al., 2001). Thus, targeting maternal attachment security may positively affect parenting behaviors by reducing parental distress and increasing parental empathy; additional research is needed to determine whether targeting maternal attachment security or parenting behaviors directly would be more effective in reducing psychopathology symptoms in children of mothers who experienced maltreatment in childhood.

While these findings are important in extending results of previous investigations concerning the effects of parenting stress on child outcomes, this study has three important limitations. First, all measures included were self-report, and may be influenced by social desirability or demand characteristics. For example, participants may be reluctant to report avoidant or anxious attachment tendencies or may report otherwise biased estimates of their own attachment security. They may also be reluctant to endorse sensitive items related to childhood maltreatment experiences, leading to possible underreporting of childhood maltreatment severity. Second, we obtained information on maternal history of childhood maltreatment using retrospective report (CTQ; Bernstein et al., 2003), which may be influenced by memory for childhood events; moreover, retrospectively-reported childhood adverse experiences have been found to have low to moderate agreement with experiences prospectively documented throughout childhood (Reuben et al., 2016). It is also possible that attachment style influences reporting of childhood experiences, such that women with insecure attachment styles might either over- or under-report experiences as traumatic compared with securely attached women.

This could either enhance or reduce the observed association between childhood trauma and adult attachment style, depending on the direction of change in reporting.

Further, the CTQ does not allow investigators to consider additional characteristics of maltreatment experiences, including the onset, chronicity, and frequency of these experiences. To collect information beyond severity of maltreatment and allow investigators to examine the intergenerational transmission of maltreatment across these additional dimensions, future studies should use a more comprehensive measure of childhood experiences. Finally, with a sample of 96 dyads, this study was underpowered to test more complex statistical models (e.g., whether these pathways differed based on offspring sex/gender).

CONCLUSION

Taken together, the current study adds to previous work mapping pathways from women's experiences in childhood and their young offspring's mental health through attachment security reported in pregnancy. Our findings have important clinical implications. We provide evidence that maternal attachment security explains, in part, the association between maternal childhood experiences of abuse and neglect and increased young child psychopathology symptoms. Evidence that attachment security mediates effects of childhood adversity on offspring is of particular interest to clinicians not only because attachment security can predict response to psychotherapeutic interventions (Shorey & Snyder, 2006), but also because in contrast to life history, attachment domain may be modifiable (Kilmann et al., 1999; Kinley & Reyno, 2013)

REFERENCES

Achenbach, T. M. (1999). The Child Behavior Checklist and related instruments. In *The use of psychological testing for treatment planning and outcomes assessment, 2nd ed.* (pp. 429–466). Lawrence Erlbaum Associates Publishers.

Achenbach, T. M., & Rescorla, L. A. (2000). *Manual for the ASEBA Preschool Forms & Profiles*. University of Vermont, Research Center for Children, Youth, and Families.

Achenbach, T. M., & Rescorla, L. A. (2013). Achenbach System of Empirically Based Assessment. In F. R. Volkmar (Ed.), *Encyclopedia of Autism Spectrum Disorders* (pp. 31–39). Springer New York. https://doi.org/10.1007/978-1-4419-1698-3_219

Ainsworth, M. D. S., Blehar, M. C., Waters, E., & Wall, S. N. (1978). Patterns of attachment: A psychological study of the strange situation. In *Child Abuse and Neglect*. Erlbaum. https://doi.org/10.1007/978-0-230-80239-1_3

Alhusen, J. L., Hayat, M. J., & Gross, D. (2013). A longitudinal study of maternal attachment and infant developmental outcomes. *Archives of Women's Mental Health*, *16*(6), 521–529. https://doi.org/10.1007/s00737-013-0357-8

Babcock Fenerci, R. L., & Allen, B. (2018). From mother to child: Maternal betrayal trauma and risk for maltreatment and psychopathology in the next generation. *Child Abuse and Neglect*, *82*(January 2018), 1–11. https://doi.org/10.1016/j.chiabu.2018.05.014

Babcock Fenerci, R. L., & DePrince, A. P. (2018). Intergenerational transmission of trauma: Maternal trauma–related cognitions and toddler symptoms. *Child Maltreatment*, *23*(2), 126–136. https://doi.org/10.1177/1077559517737376

Bernstein, D. P., Stein, J. A., Newcomb, M. D., Walker, E., Pogge, D., Ahluvalia, T., Stokes, J., Handelsman, L., Medrano, M., Desmond, D., & Zule, W. (2003). Development and

validation of a brief screening version of the Childhood Trauma Questionnaire. *Child Abuse and Neglect*, *27*(2), 169–190. https://doi.org/10.1016/S0145-2134(02)00541-0

Berthelot, N., Ensink, K., Bernazzani, O., Normandin, L., Luyten, P., & Fonagy, P. (2015). Intergenerational transmission of attachment in abused and neglected mothers: The role of trauma-specific reflective functioning. *Infant Mental Health Journal*, *36*(2), 200–212. https://doi.org/10.1002/imhj.21499

Bifulco, A., Kwon, J., Jacobs, C., Moran, P. M., Bunn, A., & Beer, N. (2006). Adult attachment style as mediator between childhood neglect/abuse and adult depression and anxiety. *Social Psychiatry and Psychiatric Epidemiology*, *41*(10), 796–805. https://doi.org/10.1007/s00127-006-0101-z

Blaustein, M. E., & Kinniburgh, K. M. (2018). *Treating Traumatic Stress in Children and Adolescents, Second Edition: How to Foster Resilience through Attachment, Self-Regulation, and Competency* (2nd ed.). The Guilford Press.

Bowers, M. E., & Yehuda, R. (2016). Intergenerational transmission of stress in humans. *Neuropsychopharmacology*, *41*(1), 232–244. https://doi.org/10.1038/npp.2015.247

Bowlby, J. (1969). Attachment and loss. In *Attachment, Vol. 1*. https://doi.org/https://doi.org/10.1177/000306518403200125

Brennan, K. A., Clark, C. L., & Shaver, P. R. (1998). Self-report measurement of adult attachment: An integrative overview. In J. A. Simpson & W. S. Rholes (Eds.), *Attachment theory and close relationships* (pp. 46–76). Guilford Press.

Britto, P. R., Lye, S. J., Proulx, K., Yousafzai, A. K., Matthews, S. G., Vaivada, T., Perez-Escamilla, R., Rao, N., Ip, P., Fernald, L. C. H., MacMillan, H., Hanson, M., Wachs, T. D., Yao, H., Yoshikawa, H., Cerezo, A., Leckman, J. F., & Bhutta, Z. A. (2017).

Nurturing care: Promoting early childhood development. *The Lancet*, *389*(10064), 91–102. https://doi.org/10.1016/S0140-6736(16)31390-3

Buss, C., Entringer, S., Moog, N. K., Toepfer, P., Fair, D. A., Simhan, H. N., Heim, C. M., & Wadhwa, P. D. (2017). Intergenerational transmission of maternal childhood maltreatment exposure: Implications for fetal brain development. *Journal of the American Academy of Child and Adolescent Psychiatry*, *56*(5), 373–382. https://doi.org/10.1016/j.jaac.2017.03.001

Costa, B., Pini, S., Gabelloni, P., Abelli, M., Lari, L., Cardini, A., Muti, M., Gesi, C., Landi, S., Galderisi, S., Mucci, A., Lucacchini, A., Cassano, G. B., & Martini, C. (2009). Oxytocin receptor polymorphisms and adult attachment style in patients with depression. *Psychoneuroendocrinology*, *34*(10), 1506–1514. https://doi.org/10.1016/j.psyneuen.2009.05.006

Coverdale, G. E., & Long, A. F. (2015). Emotional wellbeing and mental health: An exploration into health promotion in young people and families. *Perspectives in Public Health*, *135*(1), 27–36. https://doi.org/10.1177/1757913914558080

Crawford, A., & Benoit, D. (2009). Caregivers' disrupted representations of the unborn child predict later infant-caregiver disorganized attachment and disrupted interactions. *Infant Mental Health Journal*, *30*(2), 124–144. https://doi.org/10.1002/imhj.20207

Cyr, C., Euser, E. M., Bakermans-Kranenburg, M. J., & Van Ijzendoorn, M. H. (2010). Attachment security and disorganization in maltreating and high-risk families: A series of meta-analyses. *Development and Psychopathology*, *22*(1), 87–108. https://doi.org/10.1017/S0954579409990289

Davis, E. P., Glynn, L. M., Schetter, C. D., Hobel, C., Chicz-Demet, A., & Sandman, C. A. (2007). Prenatal exposure to maternal depression and cortisol influences infant temperament. *Journal of the American Academy of Child and Adolescent Psychiatry*, *46*(6), 737–746. https://doi.org/10.1097/chi.0b013e318047b775

Dozier, M., & Bernard, K. (2017). Attachment and Biobehavioral Catch-up: addressing the needs of infants and toddlers exposed to inadequate or problematic caregiving. *Current Opinion in Psychology*, *15*, 111–117. https://doi.org/https://doi.org/10.1016/j.copsyc.2017.03.003

Feeney, J. A., Noller, P., & Hanrahan, M. (1994). Assessing adult attachment. In M. B. Sperling & W. H. Berman (Eds.), *Attachment in adults: Clinical and developmental perspectives* (pp. 128–152). Guilford Press.

Fonagy, P., Leigh, T., Steele, M., Steele, H., Kennedy, R., Mattoon, G., Target, M., & Gerber, A. (1996). The relation of attachment status, psychiatric classification, and response to psychotherapy. *Journal of Consulting and Clinical Psychology*, *64*(1), 22–31. https://doi.org/10.1037/0022-006X.64.1.22

Fraiberg, S., Adelson, E., & Shapiro, V. (1975). Ghosts in the Nursery: A psychoanalytic approach to the problems of impaired infant-mother relationships. *Journal of the American Academy of Child Psychiatry*, *14*(3), 387–421. https://doi.org/10.1016/S0002-7138(09)61442-4

Fraley, R. C. (2002). Attachment stability from infancy to adulthood: Meta-analysis and dynamic modeling of developmental mechanisms. *Personality and Social Psychology Review*, *6*(2), 123–151.

Gray, S. A. O., Jones, C. W., Theall, K. P., Glackin, E., & Drury, S. S. (2017). Thinking across generations: Unique contributions of maternal early life and prenatal stress to infant

physiology. *Journal of the American Academy of Child and Adolescent Psychiatry*, *56*(11), 922–929. https://doi.org/10.1016/j.jaac.2017.09.001

Harris, A., & Seckl, J. (2011). Glucocorticoids, prenatal stress and the programming of disease. *Hormones and Behavior*, *59*, 279–289. https://doi.org/10.1016/j.yhbeh.2010.06.007

Harris, P. A., Taylor, R., Minor, B. L., Elliott, V., Fernandez, M., O'Neal, L., McLeod, L., Delacqua, G., Delacqua, F., Kirby, J., & Duda, S. N. (2019). The REDCap consortium: Building an international community of software platform partners. *Journal of Biomedical Informatics*, *95*(December 2018), 103208. https://doi.org/10.1016/j.jbi.2019.103208

Harris, P. A., Taylor, R., Thielke, R., Payne, J., Gonzalez, N., & Conde, J. G. (2009). Research electronic data capture (REDCap)-A metadata-driven methodology and workflow process for providing translational research informatics support. *Journal of Biomedical Informatics*, *42*(2), 377–381. https://doi.org/10.1016/j.jbi.2008.08.010

Hartman, S., Freeman, S. M., Bales, K. L., & Belsky, J. (2018). Prenatal stress as a risk—and an opportunity—factor. *Psychological Science*, *29*(4), 572–580. https://doi.org/10.1177/0956797617739983

Hayes, A. (2013). Introduction to mediation, moderation, and conditional process analysis. In *New York, NY: Guilford*. Guilford Press. https://doi.org/978-1-60918-230-4

Hazan, C., & Shaver, P. (1987). Romantic love conceptualized as an attachment process. *Journal of Personality and Social Psychology*, *52*(3), 511–524. https://doi.org/10.1037/0022-3514.52.3.511

Hazan, C., & Shaver, P. R. (1990). Love and work: an attachment-theoretical perspective. *Journal of Personality and Social Psychology*, *59*(2), 270–280. https://doi.org/10.1037/0022-3514.59.2.270

Hofstra, M. B., Van Der Ende, J., & Verhulst, F. C. (2002). Child and adolescent problems predict DSM-IV disorders in adulthood: A 14-year follow-up of a Dutch epidemiological sample. *Journal of the American Academy of Child and Adolescent Psychiatry*, *41*(2), 182–189. https://doi.org/10.1097/00004583-200202000-00012

Huth-Bocks, A. C., Levendosky, A. A., Bogat, G. A., & Von Eye, A. (2004). The impact of maternal characteristics and contextual variables on infant-mother attachment. *Child Development*, *75*(2), 480–496. https://doi.org/10.1111/j.1467-8624.2004.00688.x

Kapoor, A., Dunn, E., Kostaki, A., Andrews, M. H., & Matthews, S. G. (2006). Fetal programming of hypothalamo-pituitary-adrenal function: Prenatal stress and glucocorticoids. *Journal of Physiology*, *572*(1), 31–44. https://doi.org/10.1016/j.poly.2005.06.060

Kilmann, P. R., Laughlin, J. E., Carranza, L. V, Downer, J. T., Major, S., & Parnell, M. M. (1999). Effects of an attachment-focused group preventive intervention on insecure women. *Group Dynamics: Theory, Research, and Practice*, *3*(2), 138–147. https://doi.org/10.1037/1089-2699.3.2.138

Kinley, J. L., & Reyno, S. M. (2013). Attachment style changes following intensive short-term group psychotherapy. *International Journal of Group Psychotherapy*, *63*(1), 53–75.

Kirchmann, H., Steyer, R., Mayer, A., Joraschky, P., Schreiber-Willnow, K., & Strauss, B. (2012). Effects of adult inpatient group psychotherapy on attachment characteristics: An

observational study comparing routine care to an untreated comparison group. *Psychotherapy Research*, *22*(1), 95–114. https://doi.org/10.1080/10503307.2011.626807

Kraemer, H. C., Kiernan, M., Essex, M., & Kupfer, D. J. (2008). How and why criteria defining moderators and mediators differ between the Baron & Kenny and MacArthur approaches. *Health Psychology*, *27*(2 Suppl), S101–S108. https://doi.org/10.1037/0278-6133.27.2(Suppl.).S101

Kraemer, H. C., Wilson, G. T., Fairburn, C. G., & Agras, W. S. (2002). Mediators and moderators of treatment effects in randomized clinical trials. *Archives of General Psychiatry*, *59*(10), 877–883. https://doi.org/10.1001/archpsyc.59.10.877

Lang, A. J., Gartstein, M. A., Rodgers, C. S., & Lebeck, M. M. (2010). The impact of maternal childhood abuse on parenting and infant temperament. *Journal of Child and Adolescent Psychiatric Nursing*, *23*(2), 100–110. https://doi.org/10.1111/j.1744-6171.2010.00229.x

Levy, K. N., Meehan, K. B., Kelly, K. M., Reynoso, J. S., Weber, M., Clarkin, J. F., & Kernberg, O. F. (2006). Change in attachment patterns and reflective function in a randomized control trial of transference-focused psychotherapy for borderline personality disorder. *Journal of Consulting and Clinical Psychology*, *74*(6), 1027–1040. https://doi.org/10.1037/0022-006X.74.6.1027

Malone, J. C., Levendosky, A. A., Dayton, C. J., & Bogat, G. A. (2010). Understanding the "ghosts in the nursery" of pregnant women experiencing domestic violence: Prenatal maternal representations and histories of childhood maltreatment. *Infant Mental Health Journal*, *31*(4), 432–454. https://doi.org/10.1002/imhj.20264

Mesman, J., & Koot, H. M. (2001). Early preschool predictors of preadolescent internalizing and externalizing DSM-IV diagnoses. *Journal of the American Academy of Child and*

Adolescent Psychiatry, *40*(9), 1029–1036. https://doi.org/10.1097/00004583-200109000-00011

Mickelson, K. D., Kessler, R. C., & Shaver, P. R. (1997). Adult attachment in a nationally representative sample. *Journal of Personality and Social Psychology*, *73*(5), 1092–1106. https://doi.org/10.1037/0022-3514.73.5.1092

Mikulincer, M., Gillath, O., Halevy, V., Avihou, N., Avidan, S., & Eshkoli, N. (2001). Attachment theory and reactions to others' needs: Evidence that activation of the sense of attachment security promotes empathic responses. *Journal of Personality and Social Psychology*, *81*(6), 1205–1224. https://doi.org/10.1037/0022-3514.81.6.1205

Min, M. O., Singer, L. T., Minnes, S., Kim, H., & Short, E. (2013). Mediating links between maternal childhood trauma and preadolescent behavioral adjustment. *Journal of Interpersonal Violence*, *28*(4), 831–851. https://doi.org/10.1177/0886260512455868

Myhre, M. C., Dyb, G. A., Wentzel-Larsen, T., Grøgaard, J. B., & Thoresen, S. (2014). Maternal childhood abuse predicts externalizing behaviour in toddlers: A prospective cohort study. *Scandinavian Journal of Public Health*, *42*(3), 263–269. https://doi.org/10.1177/1403494813510983

Petty, C. R., Rosenbaum, J. F., Hirshfeld-Becker, D. R., Henin, A., Hubley, S., LaCasse, S., Faraone, S. V., & Biederman, J. (2008). The child behavior checklist broad-band scales predict subsequent psychopathology: A 5-year follow-up. *Journal of Anxiety Disorders*, *22*(3), 532–539. https://doi.org/10.1016/j.janxdis.2007.04.003

Pihlakoski, L., Sourander, A., Aromaa, M., Rautava, P., Helenius, H., & Sillanpää, M. (2006). The continuity of psychopathology from early childhood to preadolescence: A

prospective cohort study of 3-12-year-old children. *European Child and Adolescent Psychiatry*, *15*(7), 409–417. https://doi.org/10.1007/s00787-006-0548-1

Plant, D. T., Jones, F. W., Pariante, C. M., & Pawlby, S. (2017). Association between maternal childhood trauma and offspring childhood psychopathology: Mediation analysis from the ALSPAC cohort. *British Journal of Psychiatry*, *211*(3), 144–150. https://doi.org/10.1192/bjp.bp.117.198721

Powell, B., Cooper, G., Hoffman, K., & Marvin, B. (2016). *The Circle of Security Intervention Enhancing Attachment in Early Parent-Child Relationships*. The Guilford Press.

R Core Team. (2018). *R: A Language and Environment for Statistical Computing* (3.0.0). R Foundation for Statistical Computing. https://www.r-project.org/

Ravitz, P., Maunder, R., Hunter, J., Sthankiya, B., & Lancee, W. (2010). Adult attachment measures: A 25-year review. *Journal of Psychosomatic Research*, *69*(4), 419–432. https://doi.org/10.1016/j.jpsychores.2009.08.006

Reck, C., Nonnenmacher, N., & Zietlow, A. L. (2016). Intergenerational transmission of internalizing behavior: The role of maternal psychopathology, child responsiveness and maternal attachment style insecurity. *Psychopathology*, *49*(4), 277–284. https://doi.org/10.1159/000446846

Rescorla, L. A. (2005). Assessment of young children using the Achenbach System of Empirically Based Assessment (ASEBA). *Mental Retardation and Developmental Disabilities Research Reviews*, *11*(3), 226–237. https://doi.org/10.1002/mrdd.20071

Reuben, A., Moffitt, T. E., Caspi, A., Belsky, D. W., Harrington, H., Schroeder, F., Hogan, S., Ramrakha, S., Poulton, R., & Danese, A. (2016). Lest we forget: comparing retrospective and prospective assessments of adverse childhood experiences in the prediction of adult

health. *Journal of Child Psychology and Psychiatry and Allied Disciplines*, *57*(10), 1103–1112. https://doi.org/10.1111/jcpp.12621

Rijlaarsdam, J., Stevens, G. W. J. M., Jansen, P. W., Ringoot, A. P., Jaddoe, V. W. V., Hofman, A., Ayer, L., Verhulst, F. C., Hudziak, J. J., & Tiemeier, H. (2014). Maternal childhood maltreatment and offspring emotional and behavioral problems: Maternal and paternal mechanisms of risk transmission. *Child Maltreatment*, *19*(2), 67–78. https://doi.org/10.1177/1077559514527639

Shonkoff, J. P., & Phillips, D. A. (2000). *From neurons to neighborhoods: The science of early childhood development*. National Academy Press.

Shorey, H. S., & Snyder, C. R. (2006). The role of adult attachment styles in psychopathology and psychotherapy outcomes. *Review of General Psychology*, *10*(1), 1–20. https://doi.org/10.1037/1089-2680.10.1.1

Sroufe, L. A. (2005). Attachment and development: A prospective, longitudinal study from birth to adulthood. *Attachment and Human Development*, *7*(4), 349–367. https://doi.org/10.1080/14616730500365928

Stern, J. A., Fraley, R. C., Jones, J. D., Gross, J. T., Shaver, P. R., & Cassidy, J. (2018). Developmental processes across the first two years of parenthood: stability and change in adult attachment style. *Developmental Psychology*, *54*(5), 975–988. https://doi.org/10.1037/dev0000481

Tasca, G., Balfour, L., Ritchie, K., & Bissada, H. (2007). Change in attachment anxiety is associated with improved depression among women with binge eating disorder. *Psychotherapy: Theory, Research, Practice, Training*, *44*(4), 423–433. https://doi.org/10.1037/0033-3204.44.4.423

Travis, L. A., Binder, J. L., Bliwise, N. G., & Lynn Horne-Moyer, H. (2001). Changes in clients' attachment styles over the course of time-limited dynamic psychotherapy. *Psychotherapy*, *38*(2), 149–159. https://doi.org/10.1037/0033-3204.38.2.149

Visser, J. C., Smeekens, S., Rommelse, N., Verkes, R. J., Van Der Gaag, R. J., & Buitelaar, J. K. (2010). Assessment of psychopathology in 2- to 5-year-olds: Applying the Infant-Toddler Social Emotional Assessment. *Infant Mental Health Journal*, *31*(6), 611–629. https://doi.org/10.1002/imhj.20273

Waters, E., Merrick, S., Treboux, D., Crowell, J., & Albersheim, L. (2000). Attachment security in infancy and early adulthood: A twenty-year longitudinal study. *Child Development*, *71*(3), 684–689. https://doi.org/10.1111/1467-8624.00176

Waters, E., Weinfield, N. S., & Hamilton, C. E. (2000). The stability of attachment security from infancy to adolescence and early adulthood. *Child Development*, *71*(3), 703–706. https://doi.org/10.1111/1467-8624.00179

Widom, C. S., Czaja, S. J., Kozakowski, S. S., & Chauhan, P. (2018). Does adult attachment style mediate the relationship between childhood maltreatment and mental and physical health outcomes? *Child Abuse & Neglect*, *76*, 533–545. https://doi.org/10.1016/j.chiabu.2017.05.002.