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Research paper

Individuals' marital instability mediates the association of their perceived childhood parental affection predicting adulthood depression across 18 years

Madeline Eleanor Bartek [1], Nur Hani Zainal [1,*], Michelle G. Newman [1,*]

The Pennsylvania State University, University Park, PA 16802 United States

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ABSTRACT

Background: Parenting theories propose that lack of childhood parental affection confers increased vulnerability to heightened adulthood depression. However, only a few prospective studies have examined this topic, and no studies included mediators of the childhood parental affection–adulthood depression connection. Objective: This study examined parenting, and interpersonal theories by determining if participants' (n= 2,825) mid-life marital instability mediated their perceived childhood parental affection predicting depressive symptoms in adulthood across 18 years. Methods: Childhood maternal and paternal affection (Parental Support Scale) was measured at Time 1 (T1). Depressive symptoms (Composite International Diagnostic Interview-Short Form) were measured at T1, Time 2 (T2), and Time 3 (T3), spaced approximately nine years apart. Marital instability (Marital Instability Index) was measured at T1 and T2. Structural equation modeling analyses were conducted to test whether perceived childhood parental affection would independently negatively predict T3 depressive symptoms, and if participants' mid-life marital instability mediated those relations. All analyses adjusted for prior levels of mediator and outcome variables. Results: Lower perceived childhood maternal and paternal affection predicted higher T3 depressive symptoms. Lower childhood maternal and paternal affection predicted higher T2 marital instability. Greater marital instability in turn predicted elevated T3 depression. Individuals' marital instability mediated those associations, by accounting for 17–20% of the total effects. Conclusion: Findings highlight the importance of perceived childhood parental affection to nurture a strong marital bond to reduce the odds of developing major depressive disorder in middle-to-late adulthood.

1. Introduction

Major depressive disorder (MDD) is one of the most common mental disorders globally (Whiteford et al., 2013). In the United States, the lifetime prevalence for MDD is estimated to be 16.2%, and 60% of sufferers of MDD experience severe functional impairment (Kessler et al., 2003). Such impairment includes lack of participation in rewarding professional, social or leisure activities and limited interactions with family, friends, colleagues, and significant others (Blanco and Barnett, 2014). MDD also has been associated with poorer job performance, work productivity, and increased absenteeism (Lerner and Henke, 2008). Further, there is evidence that MDD might put people at risk for major neurocognitive disorders (Zainal and Newman, 2018; (Zainal & Newman, 2021, in press); Zainal and Newman, 2021) and chronic cardiovascular, autoimmune, and metabolic health conditions such as angina, arthritis, asthma, and diabetes (Moussavi et al., 2007). Moreover, MDD is currently the second major cause of disability globally (Ferrari et al., 2013), and has been projected to be the greatest cause of disability by 2030 (Mathers and Loncar, 2006). Given adverse individual and societal impacts of MDD and its high prevalence, identifying risk factors for this

* Corresponding authors.
E-mail addresses: hani.bzainal@gmail.com (N.H. Zainal), mgn1@psu.edu (M.G. Newman).
[1] Madeline Eleanor Bartek, Nur Hani Zainal, Michelle G. Newman, Department of Psychology, The Pennsylvania State University, University Park. Correspondence concerning this article should be addressed to Nur Hani Zainal, Department of Psychology, The Pennsylvania State University, University Park, PA 16802. E-mail: nvz5057@psu.edu. Telephone: 814–863–0115. The data used in this publication were made available by the Data Archive on University of Wisconsin - Madison Institute on Aging, 1300 University Avenue, 2245 MSC, Madison, Wisconsin 53706–1532. Since 1995 the Midlife Development in the United States (MIDUS) study has been funded by the following: John D. and Catherine T. MacArthur Foundation Research Network; National Institute on Aging (P01-AG020166); National institute on Aging (U19-AG051426). The original investigators and funding agency are not responsible for the analyses or interpretations presented here.

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common mental illness is important.

Theories of caregiver impact (e.g., Jorm et al., 2003; Rohner and Britner, 2002) assert that lack of childhood parental affection as perceived by the individual is a risk factor for future psychopathology as it hinders optimal development of emotion regulation, communication, and social skills. In addition, Bowlby (1977; 1982) has proposed that high levels of parental affection, availability, and support create a sense of safety, protection, and comfort in times of distress, which are theorized to protect against MDD. Relatedly, these models also posit that childhood parental affection deficiencies render persons more susceptible to adopting unhelpful core beliefs about one-self, circumstances, and the future (e.g., frequent self-deprecation, assuming the worst about future events, etc.) which is thought to be a risk factor for MDD (Beck and Alford, 2009).

To date, at least 49 longitudinal studies have suggested a link between constructs related to parental affection and psychopathology. For example, a systematic review of 23 prospective papers observed that children who experienced dysfunctional parent-child relationships had a higher risk of mental illness later in life such as depression, anxiety, and post-traumatic stress disorder (Weich et al., 2009). Consistent with such findings, another review of 19 studies demonstrated that lack of secure attachment was reliably related to greater future internalizing symptoms (Brumariu and Kerns, 2010). Further, more frequent exposure to parental violence during childhood was predictive of anxiety, depression, and substance abuse disorders 20 to 25 years later (Paradis et al., 2009). Likewise, among 881 young, middle-aged, and older adults, increased displays of parental negativity and less parental support were associated with greater depressive symptoms across 12 years (Fuller-Iglesias et al., 2015). Moreover, less recall of childhood parental affection memories in middle to older aged adults was associated with higher levels of depression across 6 to 18 years (Chopik and Edelstein, 2019). Collectively, this body of data suggests that lack of perceived childhood parental affection would predict future heightened MDD severity.

Understanding the factors accounting for perceived childhood parental affection negatively predicting elevated adulthood MDD severity is important for a number of reasons. First, it helps us to refine our comprehension of risk factors for MDD. Better understanding of the risk factors for MDD can also guide the development of evidence-based preventative treatment programs for parents and children. For example, empirically-supported treatments can be adapted to specifically address symptoms related to parenting and interpersonal factors. Treatments include traditional face-to-face and online cognitive-behavioral therapies (Cuijpers et al., 2009; Muñoz et al., 2010; Newman et al., 2015), interpersonal psychotherapy (Young et al., 2006), and problem-solving therapy (Nezu and Perri, 1989) for persons at-risk for or diagnosed with MDD. With knowledge of the factors intervening between perceived childhood parental affection and adulthood MDD, we can make greater strides toward prevention and use the current study findings to power that notion forward.

What factors might then account for the aforesaid relations between lack of perceived childhood parental affection and future heightened MDD symptoms in adulthood? One possible mediator is individuals' marital instability. *Early caregiving-adult marital relationship theories* (Rohner, 2008; Salvatore et al., 2013) propose that worse parent-child relationship quality would predict greater future depression symptoms in adulthood, and this association would be strengthened by lower adulthood intimate relationship quality. Moreover, this model posits that inadequate parental affection can make people prone to negatively biased information-processing in social situations and exhibiting unskillful social behaviors (e.g., excessive avoidance, approval-seeking, etc.) and poor conflict resolution skills. Further, negative early caregiving experiences could change individuals' frequency and intensity of internalizing symptoms later in life possibly via dissatisfying romantic relationships. Based on this theory, it is plausible that the perceived childhood parental affection-adulthood depression relation would be mediated by individuals' perceived marital instability.

As yet, only four longitudinal studies offer support for these propositions. For example, Cummings and Davies (1994) showed a negative link between childhood parental affection and likelihood of future divorce among adults who were either married or in a long-term relationship. Similarly, Möller and Stattin (2001) found that adolescents who self-reported low childhood parental affection described less relationship satisfaction during the next 12 to 15 years. Another prospective study showed that pregnant women who recalled more negative early relationships with parents were more likely to perceive that their marriages were unsustainable 24 months later (Curran et al., 2005). Also, negative parent-child bonds were related to dissatisfaction with life and low-quality relationships later in adulthood among Swedish participants (Overbeek et al., 2007). On the whole, low levels of perceived childhood parental affection may set the stage for individuals' marital instability later in life, thereby increasing the risk for future increased MDD in adulthood.

Research has also supported the idea that individuals' marital instability and related constructs predict subsequent heightened depression. Data from a sample of 1869 couples found bi-directional relations between marital discord and depressive symptoms across 2 years (Whisman and Uebelacker, 2009). Similarly, in young couples with children, lower self-reported marital quality was related with higher depressive symptoms a year later (Beach et al., 2003). Moreover, higher marital strife forecasted more negative affect in middle-to-older aged adults after 15 years (Choi and Marks, 2008). In a similar vein, 26 prospective studies showed that on average, poorer perceived marital quality (e.g., frequent disagreement and thoughts of divorce, dysfunctional communication patterns) was moderately associated with lower future psychological well-being (Proulx et al., 2007). Overall, evidence suggests that individuals' perceived marital instability would likely lead to increased depression later in life.

Building on aforesaid theories, the empirical evidence, and logic outlined, we examined the prospective associations among participants' perceived childhood parental affection and MDD severity in adulthood. In addition, we explored how high levels of their mid-life perceived marital instability mediated the inverse childhood parental affection–adulthood MDD severity connection. This study makes an important contribution as it adds to the limited longitudinal evidence base on deficits in perceived parental affection as risk factors for MDD symptoms over 18 years in a representative community adult sample with a near-equal gender ratio. Further, unlike most previous cross-sectional research, it follows participants across three time-points required for sound mediation analyses (Cole and Maxwell, 2003). Therefore, we hypothesized that less perceived childhood maternal and paternal affection would significantly predict higher future MDD severity (Hypotheses 1 and 2). Additionally, we hypothesized that perceived childhood maternal and paternal affection–adulthood MDD severity negative relation would be mediated by individuals' marital instability (Hypotheses 3 and 4).

2. Methods

2.1. Participants

The present study used the publicly available Midlife Development in the United States (MIDUS) dataset. Data was collected across three waves of assessment to gather information on behavioral and psychosocial factors for physical and mental health (Ryff and Lachman, 2017, 2018; Ryff et al., 2017a, 2017b): 1995–1996 (Time 1 [T1]); 2004–2005 (Time 2 [T2]); 2012–2013 (Time 3 [T3]). In this study, participants ($N = 2825$) averaged 45.55 years ($SD = 11.39$, range = 20–74), and 54.16% were female. Data was gathered via clinical interviews by telephone, then subsequently participants were sent a mailed questionnaire (Brim et al., 2000). Whereas data on MDD was collected via interviews across three waves, perceived childhood maternal and paternal affection was

assessed at T1, and participants' marital instability was measured at T1 and T2. The percentage of married (vs. never married, divorced, separated, or widowed) persons were 72.3%, 72.8%, and 67.1% at T1, T2, and T3 respectively.

2.2. Measures

2.2.1. Parental affection

Perceived childhood parental affection at T1 was measured using a 7-item *Parental Support Scale* (Rossi, 2001). Perceived childhood maternal and paternal affection were retrospectively assessed separately, each on a 6-item scale (e.g., "How much time and attention did your mother/-father give you when you needed it?"). Participants rated it on a 4-point Likert scale (1 (*not at all*) to 4 (*a lot*)). High internal consistency has been found for the scales (Cronbach's αs = 0.91 and 0.93 for maternal affection and paternal affection respectively) (Rossi, 2001).

2.2.2. Marital instability

Individuals' marital instability was measured using the 5-item *Marital Instability Index* (Booth et al., 1983). Examples of items included, "During the past year, how often have you thought your relationship might be in trouble?" and "What do you think the chances are that you and your partner will eventually separate?" Participants endorsed on a 4-point Likert scale ranging from 1 (*not at all*) to 4 (*very likely*). This measure has shown satisfactory internal consistency at T1 (α = 0.69) and T2 (α = 0.70) herein.

2.2.3. MDD severity

MDD symptom severity was measured by using the *World Health Organization's Composite International Diagnostic Interview-Short Form* (WHO CIDI-SF; Kessler et al., 1998), based on the *Diagnostic and Statistical Manual of Mental Disorders – Revised Third Version* (DSM-III-R; American Psychiatric Association, 1980). Participants answered the question, "In your lifetime, have you ever had two weeks or more when nearly every day you felt sad, blue, depressed? Have there ever been two weeks or longer when you lost interest in most things like work or hobbies or things you usually like to do for fun?" Subsequently, those who endorsed 'yes' on either of the two stem questions reported whether they had experienced any of the following seven depressive symptoms over the last 12 months: low mood, loss of interest, fatigue, appetite, sleep disturbances, poor concentration, suicidal ideation. Participants responded on a dichotomous scale (either 0 (*no*) or 1 (*yes*)). MDD symptom severity ranged from 0 (*no depressive symptoms*) to 7 (*highest frequency of depressive symptoms*). The CIDI-SF has strong internal consistency (0.94 in this study), good sensitivity (89.6%), specificity (93.9%), and agreement (93.2%) relative to the full CIDI (Kessler et al., 1998). Table 1 presents the items of the measures used in this study and Table 2 presents the descriptive statistics alongside the correlation matrix of all the study variables.

Table 1
Items of measures used to assess study variables.

Construct	Item	Scale points
Major depressive disorder symptom severity	During two weeks in past 12 months, when you felt sad, blue, or depressed, did you…	0 = No 1 = Yes
	(1) Lose interest in most things?	
	(2) Feel more tired out or low on energy than is usual?	
	(3) Lose your appetite or experienced appetite increase?	
	(4) Have more trouble falling asleep than usual?	
	(5) Have a lot more trouble concentrating than usual?	
	(6) Feel down on yourself, no good, or worthless?	
	(7) Think a lot about death?	
Perceived childhood maternal affection	(1) How much did she understand your problems and worries?	1 = Not at all 2 = *A* little 3 = Some 4 = *A* lot
	(2) How much could you confide in her about things that were bothering you?	
	(3) How much love and affection did she give you?	
	(4) How much time and attention did she give you when you needed it?	
	(5) How much effort did she put into watching over you and making sure you had a good upbringing?	
	(6) How much did she teach you about life?	
Perceived childhood paternal affection	(1) How much did he understand your problems and worries?	1 = Not at all 2 = *A* little 3 = Some 4 = *A* lot
	(2) How much could you confide in him about things that were bothering you?	
	(3) How much love and affection did he give you?	
	(4) How much time and attention did he give you when you needed it?	
	(5) How much effort did he put into watching over you and making sure you had a good upbringing?	
	(6) How much did he teach you about life?	
Individuals' marital instability	(1) During the past year, how often have you thought your relationship might be in trouble?	1 = Not at all 2 = *A* little 3 = Some 4 = *A* lot
	(2) Realistically, what do you think the chances are that you and your partner will eventually separate?	
	(3) How much do you and your spouse or partner disagree on the following issues?	
	a Money matters, such as how much to spend, save or invest	
	b Household tasks, such as what needs doing and who does it	
	c Leisure time activities, such as what to do and with whom	

Note. DSM-III-*R* = diagnostic and statistical manual – third version – revised.

2.3. Procedures

The sample comprised 2825 participants who completed questionnaires on perceived childhood parental affection and participants' current marital instability, as well as a clinical interview assessing MDD severity. We selected this subset of participants because they were able to speak to our research question.

2.4. Data analytic strategy

We conducted longitudinal structural equation modeling analyses using the *lavaan* package in *RStudio* (Version 1.3.959) (Rosseel, 2012). MDD symptom severity at T3 served as the outcome variable in all of the models. For a stringent test of our analyses, we adjusted for both our mediator (marital instability) and MDD at T1 (Cole and Maxwell, 2003). All indicators of the latent constructs were non-normally distributed ordinal data. Thus, we conducted all analyses using maximum likelihood with robust estimators (MLR) to minimize bias in the computed parameter estimates (Zhong and Yuan, 2011).

We conducted mediation analyses via a *product-of-coefficients* approach of the indirect effects ($a \times b$) for the regression coefficients of the predictor (childhood maternal *or* paternal affection) forecasting the mediator (T2 marital instability) (a path), and the mediator predicting T3 MDD severity (b path). We presented the unstandardized regression coefficients and used bootstrapping with 10,000 resampling draws (Cheung and Lau, 2008). The mediation effect size was the ratio of the indirect effect (a*b) to the total effect, $c = a*b + c'$, expressed as percentage of variance of the T2 marital instability mediator accounted for as a mediator of the T1 parental affection–T3 MDD relation (Preacher and Kelley, 2011; Wen and Fan, 2015). In total, the 1.9% missing data points were handled with full information maximum likelihood, the gold

Table 2
Descriptive statistic of study variables.

	1	2	3	4	5	6	7	8	9	10
1 T1 Age	–									
1 Females (%)	−.00	–								
1 T1 MAFF	.01	−.14***	–							
1 T1 PAFF	.05**	−.04*	.45***	–						
1 T1 MARS	.13***	.04*	.05*	.05*	–					
1 T2 MARS	.13***	.02	.05*	.05*	.38***	–				
1 T1 MDD DX	−.09***	.08***	−.14***	−.11***	−.05*	.01	–			
1 T1 MDD SX	−.08***	.08***	−.14***	−.10***	−.04*	.02	.96***	–		
1 T3 MDD DX	−.09***	.08***	−.14***	−.10***	−.06***	.00	.28***	.27***	–	
1 T3 MDD SX	−.08***	.08***	−.13***	−.10***	−.06**	.00	.26***	.25***	.96***	–
Mean or *n*	45.62	1799	3.13	2.72	2.84	2.90	385	0.12	327	0.10
SD or%	11.41	63.68	0.67	0.79	0.43	0.43	13.63	0.32	11.58	0.30
Minimum	20.00	–	0.96	0.75	1.00	1.00	–	0.00	–	0.00
Maximum	74.00	–	3.96	3.96	4.00	4.00	–	1.00	–	1.00
Skewness	0.24	–	−0.87	−0.32	−0.52	−0.65	–	2.39	–	2.68
Kurtosis	−0.70	–	0.16	−0.79	0.26	0.24	–	3.70	–	5.19

Note. * $p < .05$.
** $p < .01$.
*** $p < .001$; T1 = time 1; T2 = time 2; T3 = time 3; MAFF = maternal affection; PAFF = paternal affection; MARS = marital instability; MDD = major depressive disorder; DX = diagnosis; SX = symptom severity.

standard (Enders and Bandalos, 2001). Tests of model's assumptions were conducted before analysis of each hypothesis.

We assessed each model's *empirical identification status* by comparing the model's fully standardized solutions against conventionally acceptable loadings (Graham, 2005). The pattern of standardized factor loadings suggested that all measurement models were empirically identified. For large samples, χ^2 tends to be statistically significant (Brown, 2006), despite the candidate model differing from the true saturated model by trivial amounts. To assess each model's goodness-of-fit, we used practical goodness-of-fit indices and heuristic cut-offs (Kline, 2016b, 2016a): Tucker-Lewis Index (TLI; Bentler and Bonett, 1980; Tucker and Lewis, 1973; TLI $\geq$ .95), confirmatory fit index (CFI; Bentler, 1990; McDonald and Marsh, 1990; CFI $\geq$ .95), root mean square error of approximation (RMSEA; Steiger, 1990; RMSEA $\leq$ .050), and standardized root mean square residual (SRMR; Hu and Bentler, 1999; SRMR $\leq$ .080).

3. Results

3.1. Direct effects of childhood parental affection on future MDD severity

The structural models for the first two hypotheses showed excellent fit when the predictors were perceived childhood maternal ($\chi^2(df = 344) = 347.14$, $p = .442$, CFI = 1.00, RMSEA = .002, SRMR = .027) and paternal affection ($\chi^2(df = 344) = 334.66$, $p = .631$, CFI = 1.00, RMSEA = .000, SRMR = .027). Supporting Hypothesis 1, the direct path of perceived childhood maternal affection negatively predicting T3 MDD severity was significant ($\beta = -0.012$, $SE = 0.004$, $z = -3.092$, $p = .002$). Similarly, supporting Hypothesis 2, the direct path of perceived childhood paternal affection independently negatively predicting T3 MDD severity ($\beta = -0.007$, $SE = 0.003$, $z = -2.454$, $p = .014$) was significant.

3.2. Indirect effects of parental affection on future MDD

When participants' marital instability was tested as the mediator, the structural models displayed acceptable model fit for Hypothesis 3 ($\chi^2(df = 294) = 597.126$, $p < .001$, CFI = .986, RMSEA = .022, SRMR = .036) and Hypothesis 4 ($\chi^2(df = 294) = 611.05$, $p < .001$, CFI = .989, RMSEA = .023, SRMR = .036). Individuals' marital instability mediated the link between perceived childhood parental affection and adulthood MDD symptom severity. Lower perceived childhood maternal affection significantly predicted more T2 individuals' marital instability ($\beta = -0.107$, $SE = 0.023$, $z = -4.597$, $p < .001$), and higher T2 individuals' marital instability in turn substantially predicted greater T3 MDD severity ($\beta = 0.017$, $SE = 0.006$, $z = 2.940$, $p = .003$). Hypothesis 3 that proposed T2 participants' marital instability would mediate the relation between their perceived childhood maternal affection and T3 MDD severity was also significant ($\beta = -0.002$, $SE = 0.001$, $z = -2.506$, $p = .012$). Individuals' marital instability explained 20.00% of the variance of the relation between perceived childhood maternal affection and T3 MDD severity. Accordingly, Hypothesis 3 was supported.

For Hypothesis 4, lower perceived childhood paternal affection substantially predicted higher T2 participants' marital instability ($\beta = -0.090$, $SE = 0.018$, $z = -5.017$, $p < .001$), and greater T2 participants' marital instability then considerably predicted more T3 MDD severity ($\beta = 0.016$, $SE = 0.006$, $z = 2.708$, $p = .007$). Hypothesis 4 (T2 participants' marital instability would mediate the relation between perceived childhood paternal affection and T3 MDD severity) was also statistically significant (indirect effect: $\beta = -0.001$, $SE = 0.001$, $z = -2.346$, $p = .019$). Individuals' marital instability accounted for 16.67% of the variance of the relation between perceived childhood paternal affection and T3 MDD severity. Figs. 1 and 2 present the unstandardized regression estimates, factor loadings, and error variances of the parameter estimates for Hypotheses 3 and 4, respectively.

4. Discussion

This novel 18-year longitudinal study extends scarce literature by demonstrating individuals' marital instability mediated the link between perceived childhood parental affection and adulthood MDD severity. Results are also consistent with theories (Bowlby, 1977, 1982; Michiels et al., 2010), that propose that lack of perceived childhood parental affection plays a salient role in the etiology of MDD. This study also builds on prior prospective work by deepening our understanding as to why the parental affection-MDD symptom severity connection exists. We offer potential accounts for this pattern of findings to expand theoretical understanding on this topic.

Regarding direct effects, our findings that lower perceived childhood maternal and paternal affection forecasted heightened MDD severity support *parental affection theories* (Jorm et al., 2003) and are consistent with four prospective prior studies. For example, lower child-parent trust and communication at 15 years of age predicted more severe depressive symptoms in adolescence and young adulthood (16–30 years of age; Jakobsen et al., 2012). In a similar vein, another 3-wave study showed that deficits in perceived maternal and paternal warmth predicted heightened MDD 3 years later (del Barrio, Holgado-Tello, and Carrasco, 2016). Likewise, our results extend a recent report that less childhood parental connectedness predicted moderate and fluctuating

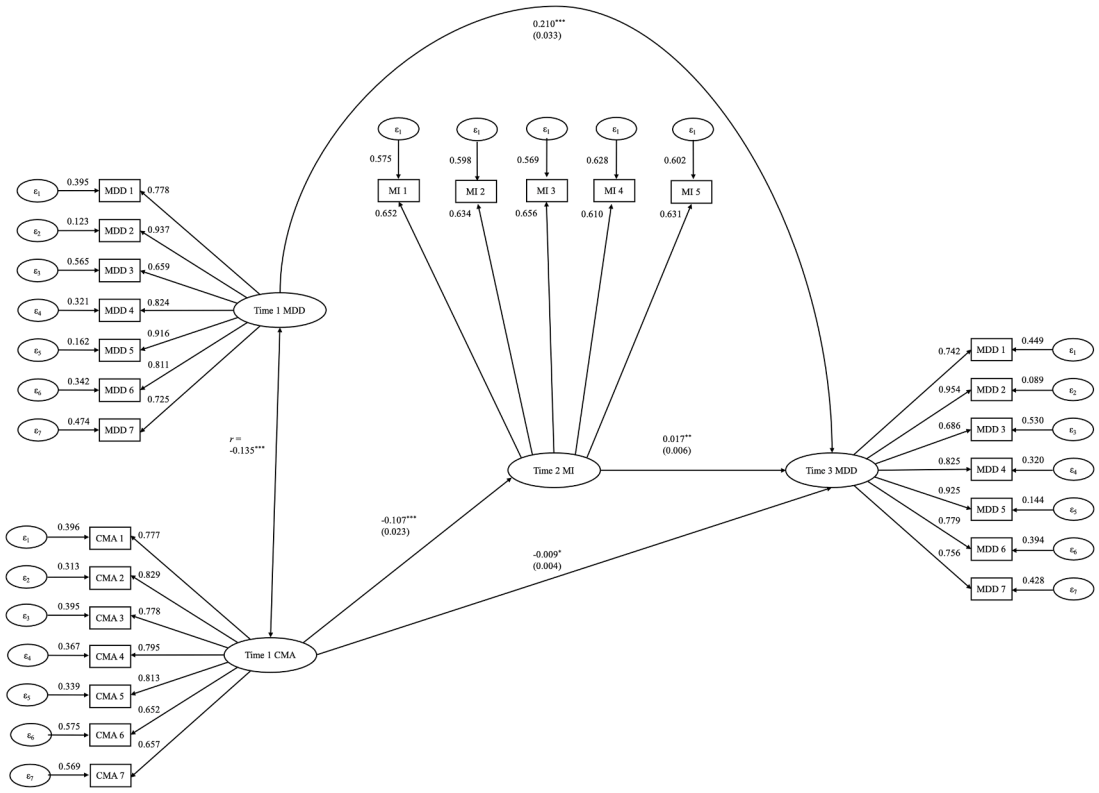

Fig. 1. Childhood Maternal Affection Predicting T3 MDD via T2 Marital Instability
Note. *** $p \leq 0.001$; ** $p \leq 0.01$; * $p \leq 0.05$.
Model fit indices: $\chi^2(df = 294) = 597.126$, $p < .001$, CFI = .986, RMSEA = .022, SRMR = .036. CFI = confirmatory fit index; CMA = childhood maternal affection; MDD = major depressive disorder; MI = marital instability; RMSEA = root mean square error of approximation; SRMR = square root mean residual; T1 = time 1; T2 = time 2; T3 = time 3.

levels of depression severity from childhood to adolescence in a large community sample (Olufowote et al., 2020). Furthermore, reduced parental warmth was found to increase the risk for depression and anxiety in youth (Yap et al., 2014). Taken together, our study supports arguments that parental affection predicts depressive symptoms later in life. Our findings also build on these published studies by using a longer time-period and examining the *processes* that may explain the childhood parental affection-adulthood MDD association.

What might account for the direct effect of perceived childhood parental affection positively predicting lower MDD severity? Perhaps higher perceived childhood parental affection promotes positive self-esteem and adaptive coping strategies, thereby reducing the risk of subsequent heightened MDD. Findings that close parent-child relations were critical for the development of healthy self-esteem (Harris et al., 2015, 2017) and higher parental responsiveness and warmth predicted more emotional adjustment 18 months later through enhanced coping skills in childhood (Watson et al., 2014) support these ideas. Upcoming investigations could examine if and whether self-esteem and coping strategies mediate the perceived childhood parental affection–adulthood depression relation alongside participants' marital instability.

Why did the inverse perceived childhood parental affection-future MDD association occur via individuals' marital instability? Plausibly, frequently experiencing dissatisfying relationships with parental figures during years of upbringing might render people vulnerable to interacting with significant others in sub-optimal ways. Individuals might tend to be more aggressive toward others if they came from a home where affection was lacking, as suggested by existing evidence (Johnson et al., 2004). Also, recurrent poor quality of parent-child interactions may hinder the development of good communicative styles important to establishing and fostering long-term satisfying intimate relationships. In addition, the lack of adaptive communication skills that accompany parental affection deficits might create problematic relationship dynamics in marriages. In general, individuals from families low in affection tended to have more hostile verbal communication (Vangelisti et al., 2007). Such patterns of unskillful communication styles may then weaken emotional and intellectual bonds between romantic partners and increase risk for heightened MDD. Moreover, perceived lack of parental affection could prevent one from learning to care for and resolve conflict with intimate partners in constructive and mature ways. Further, perceived lower childhood parental affection might lead to more frequent misunderstanding of significant others' perceptions, emotions, and motives, which might then manifest as elevated adulthood depressive symptoms. Evidence that limited perceived childhood parental affection was linked to the development of poor emotion regulation (see three-wave longitudinal study by Eisenberg et al., 2005) is consistent with these ideas. Future prospective work could attempt to confirm these speculations.

Further, although we did not measure attachment directly, our study findings may be explained by Bowlby's (1969) attachment theory, which proposed that the mental representations people hold of their primary caregivers could either predispose or protect them from heightened psychopathology symptoms in adulthood. It is plausible that children who suffered from lack of parental affection would have emotional difficulties later in life partly due to problems with developing and maintaining social relationships as well as understanding others' thoughts, feelings, and motives (i.e., maladjusted internal working models; Bretherton and Munholland, 1999). Disrupted internal working models may contribute to trust issues in relationships, misinterpretations of social interactions, ineffective communication, as well as social skills deficits that hinder the establishment of meaningful and affectionate relationships protective against future MDD (Cooley et al., 2010; DiTommaso et al., 2003).

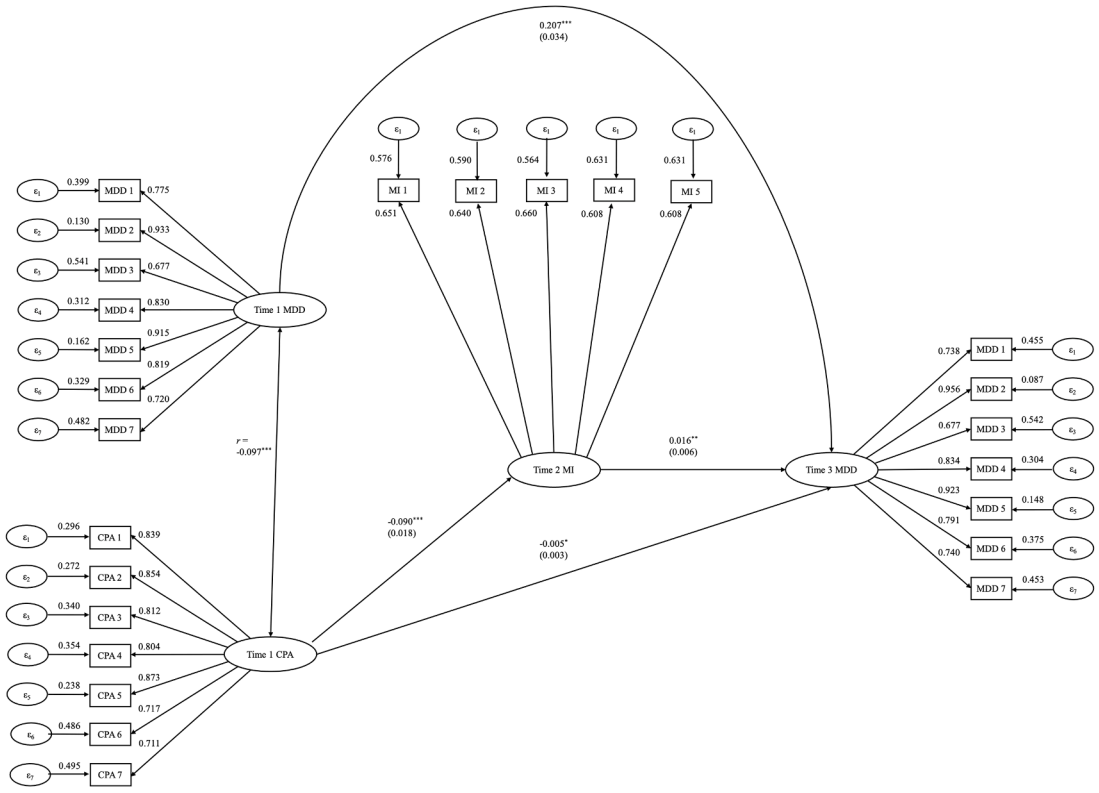

Fig. 2. Childhood Maternal Affection Predicting T3 MDD via T2 Marital Instability
Note. *** $p \leq 0.001$; ** $p \leq 0.01$; * $p \leq 0.05$.
Model fit indices: $\chi^2(df = 294) = 611.050$, $p < .001$, CFI = .989, RMSEA = .023, SRMR = .036. CFI = confirmatory fit index; CMA = childhood maternal affection; MDD = major depressive disorder; MI = marital instability; RMSEA = root mean square error of approximation; SRMR = square root mean residual; T1 = time 1; T2 = time 2; T3 = time 3.

Study limitations deserve mention. The present sample comprised mostly Caucasians (vs. ethnic minorities), highly educated, financially and physically healthy, as well as married (vs. single, divorced, or widowed) individuals (Radler and Ryff, 2010). Thus, future studies could test if findings herein extend to culturally and socio-economically diverse contexts. Also, this study used DSM-III-R criteria to measure depressive symptoms and may not generalize to DSM-5. Moreover, as the parental affection measure was retrospective in nature, it might have been subject to recall bias, and respondents' opinions of their parents' affection could have changed through the years but was not captured herein. Further, shared method variance related to retrospective memories of childhood parental affection and later stage marital instability may have contributed to findings of the associations between these constructs. Also, it is possible that self-reported childhood parental affection was affected by current negativity bias associated with adulthood depression. Adjusting for baseline MDD may have partially mitigated this problem. Nonetheless, study strengths include the 18-year, three-wave, study duration. Further, the current study used reliable and valid self-reports.

Some practical implications merit consideration. Findings suggest that parenting practices, in terms of level of warmth and affection conveyed by parental figures during children's formative years are instrumental in either mitigating or increasing future risk of increased adulthood MDD. As such, a clinical implication of this basic science study might be the need to increase dissemination of evidence-based, preventative parenting interventions, such as those delivered online and accessible to a wide audience (Cardamone-Breen et al., 2018). The results also imply that parents who frequently model adaptive behaviors (e.g., willingness to have difficult conversations on important matters, imparting good advice) to their children are likely to help them become well-adjusted adults later in life. Such efforts are crucial from a public health perspective due to the rising numbers of people suffering from major depressive episodes and suicidal ideation (Bridge et al., 2014). Moreover, subsequent work should examine how therapies that improve married couples' socio-emotional skills, such as boosting empathic accuracy and effective communication (Schmidt and Gelhert, 2017), might also effectively prevent the onset of MDD. In addition, understanding the importance of stable romantic relationships and using empirically-supported therapies to promote psychological well-being among couples could also serve as a preventative measure to reduce the risk of heightened MDD later in adulthood. By researching other potential mediators, scientists may have a better understanding of the etiology of MDD. Such understanding could lead to improved treatment options for these individuals.

Overall, more research needs to be done on other possible mediators between perceived childhood parental affection and adulthood depressive disorders. Possible mediators to be analyzed from other longitudinal cross-panel datasets could include spousal communication skills, life satisfaction, and self-esteem. It is crucial to continue to study mediators of the relationship between childhood parental affection and adulthood MDD symptoms to improve understanding of risk factors for heightened MDD in adulthood and to inform potential prevention targets.

Author contributions

Each author has (1) made substantial contributions to the conception or design of the work, or to the acquisition, analysis, or interpretation of data for the work; (2) participated in drafting the work or revising it critically for important intellectual content; (3) approved the final version to be published; and (4) agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Ethical standards

This study was conducted in compliance with the American Psychological Association (APA) ethical standards in the treatment of human participants and approved by the institutional review board (IRB). Informed consent was obtained from participants as per IRB requirements at Harvard University, Georgetown University, University of California at Los Angeles, and University of Wisconsin. Since this study used a publicly available dataset, it was exempt from IRB approval.

Declaration of competing interest

The authors do not have any conflicts of interest or financial disclosures.

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References

American Psychiatric Association, 1980. *Diagnostic and Statistical Manual of Mental Disorders* (3rd ed.). American Psychiatric Association, Washington, DC.

Beach, S.R.H., Katz, J., Kim, S., Brody, G.H, 2003. Prospective effects of marital satisfaction on depressive symptoms in established marriages: a dyadic model. J. Soc. Pers. Relat. 20, 355–371. https://doi.org/10.1177/0265407503020003005.

Beck, A.T., Alford, B.A., 2009. Depression: Causes and treatment. University of Pennsylvania Press.

Bentler, P.M., 1990. Comparative fit indexes in structural models. Psychol. Bull. 107, 238–246. https://doi.org/10.1037/0033-2909.107.2.238.

Bentler, P.M., Bonett, D.G., 1980. Significance tests and goodness of fit in the analysis of covariance structures. Psychol. Bull. 88, 588–606. https://doi.org/10.1037/0033-2909.88.3.588.

Blanco, J.A., Barnett, L.A., 2014. The effects of depression on leisure: varying relationships between enjoyment, sociability, participation, and desired outcomes in college students. Leis. Sci. 36, 458–478. https://doi.org/10.1080/01490400.2014.915772.

Booth, A., Johnson, D., Edwards, J.N., 1983. Measuring marital instability. J. Marriage Fam. 45, 387–394. https://doi.org/10.2307/351516.

Bowlby, J., 1969. Attachment and loss In: Attachment, 2nd ed., 1. Basic Books, New York.

Bowlby, J., 1977. The making and breaking of affectional bonds. I. Aetiology and psychopathology in the light of attachment theory. An expanded version of the Fiftieth Maudsley Lecture, delivered before the Royal College of Psychiatrists, 19 November 1976. Br. J. Psychiatry 130, 201–210. https://doi.org/10.1192/bjp.130.3.201.

Bowlby, J., 1982. Attachment and loss: retrospect and prospect. Am. J. Orthopsychiatry 52, 664–678. https://doi.org/10.1111/j.1939-0025.1982.tb01456.x.

Bretherton, I., Munholland, K.A., 1999. Internal working models in attachment relationships: a construct revisited. In: Cassidy, J., Shaver, P.R. (Eds.), Handbook of attachment: Theory, research, and Clinical Applications. The Guilford Press, New York, NY, US, pp. 89–111.

Bridge, J.A., Horowitz, L.M., Fontanella, C.A., Grupp-Phelan, J., Campo, J.V., 2014. Prioritizing research to reduce youth suicide and suicidal behavior. Am. J. Prev. Med. 47, S229–S234. https://doi.org/10.1016/j.amepre.2014.06.001.

Brim, O.G., Baltes, P.B., Bumpass, L.L., Cleary, P.D., Featherman, D.L., Hazzard, W.R., 2000. National Survey of Midlife Development in the United States (MIDUS), 1995-1996 [Computer File]. Inter-University Consortium for Political and Social Research, Ann Arbor, MI.

Brown, T.A., 2006. Confirmatory Factor Analysis For Applied Research. The Guilford Press, New York.

Brumariu, L.E., Kerns, K.A., 2010. Parent–child attachment and internalizing symptoms in childhood and adolescence: a review of empirical findings and future directions. Dev. Psychopathol. 22, 177–203. https://doi.org/10.1017/S0954579409990344.

Cardamone-Breen, M.C., Jorm, A.F., Lawrence, K.A., Rapee, R.M., Mackinnon, A.J., Yap, M.B.H, 2018. A single-session, web-based parenting intervention to prevent adolescent depression and anxiety disorders: randomized controlled trial. J. Med. Internet Res. 20, e148. https://doi.org/10.2196/jmir.9499.

Cheung, G.W., Lau, R.S., 2008. Testing mediation and suppression effects of latent variables: bootstrapping with structural equation models. Organ. Res. Methods 11, 296–325. https://doi.org/10.1177/1094428107300343.

Choi, H., Marks, N.F., 2008. Marital conflict, depressive symptoms, and functional impairment. J. Marriage Fam. 70, 377–390. https://doi.org/10.1111/j.1741-3737.2008.00488.x.

Chopik, W.J., Edelstein, R.S., 2019. Retrospective memories of parental care and health from mid- to late life. Health Psychology 38, 84–93. https://doi.org/10.1037/hea0000694.

Cole, D.A., Maxwell, S.E., 2003. Testing mediational models with longitudinal data: questions and tips in the use of structural equation modeling. J. Abnorm. Psychol. 112, 558–577. https://doi.org/10.1037/0021-843x.112.4.558.

Cooley, E.L., Van Buren, A., Cole, S.P., 2010. Attachment styles, social skills, and depression in college women. J. Coll. Couns. 13, 50–62. https://doi.org/10.1002/j.2161-1882.2010.tb00047.x.

Cuijpers, P., Muñoz, R.F., Clarke, G.N., Lewinsohn, P.M., 2009. Psychoeducational treatment and prevention of depression: the "coping with depression" course thirty years later. Clin. Psychol. Rev. 29, 449–458. https://doi.org/10.1016/j.cpr.2009.04.005.

Cummings, E.M., Davies, P.T., 1994. Maternal depression and child development. J. Child Psychol. Psychiatry. 35, 73–122. https://doi.org/10.1111/j.1469-7610.1994.tb01133.x.

Curran, M., Hazen, N., Jacobvitz, D., Feldman, A., 2005. Early family relationships predict marital maintenance during the transition to parenthood. J. Fam. Psychol. 19, 189–197. https://doi.org/10.1037/0893-3200.19.2.189.

del Barrio, V., Holgado-Tello, F.P., Carrasco, M.A., 2016. Concurrent and longitudinal effects of maternal and paternal warmth on depression symptoms in children and adolescents. Psychiatry Res. 242, 75–81. https://doi.org/10.1016/j.psychres.2016.05.032.

DiTommaso, E., Brannen-McNulty, C., Ross, L., Burgess, M., 2003. Attachment styles, social skills and loneliness in young adults. Pers. Individ. Differ. 35, 303–312. https://doi.org/10.1016/S0191-8869(02)00190-3.

Eisenberg, N., Zhou, Q., Spinrad, T.L., Valiente, C., Fabes, R.A., Liew, J., 2005. Relations among positive parenting, children's effortful control, and externalizing problems: a three-wave longitudinal study. Child Dev. 76, 1055–1071. https://doi.org/10.1111/j.1467-8624.2005.00897.x.

Enders, C.K., Bandalos, D.L., 2001. The relative performance of full information maximum likelihood estimation for missing data in structural equation models. Struct. Equ. Model. 8, 430–457. https://doi.org/10.1207/S15328007SEM0803_5.

Ferrari, A.J., Charlson, F.J., Norma, R.E., Patten, S.B., Freedman, G., Murray, C.J.L., Whiteford, H.A., 2013. Burden of depressive disorders by country, sex, age, and year: findings from the global burden of disease study 2010. PLoS Med. 10, e1001547 https://doi.org/10.1371/journal.pmed.1001547.

Fuller-Iglesias, H.R., Webster, N.J., Antonucci, T.C., 2015. The complex nature of family support across the life span: implications for psychological well-being. Dev. Psychol. 51, 277–288. https://doi.org/10.1037/a0038665.

Graham, J.W., 2005. *Structural Equation Modeling.* Unpublished Manuscript. The Pennsylvania State University.

Harris, M.A., Gruenenfelder-Steiger, A.E., Ferrer, E., Donnellan, M.B., Allemand, M., Fend, H., Trzesniewski, K.H., 2015. Do parents foster self-esteem? Testing the prospective impact of parent closeness on adolescent self-esteem. Child Dev. 86, 995–1013. https://doi.org/10.1111/cdev.12356.

Harris, M.A., Donnellan, M.B., Guo, J., McAdams, D.P., Garnier-Villarreal, M., Trzesniewski, K.H., 2017. Parental co-construction of 5- to 13-year-olds' global self-esteem through reminiscing about past events. Child Dev. 88, 1810–1822. https://doi.org/10.1111/cdev.12944.

Hu, L., Bentler, P.M., 1999. Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. Struct. Equ. Model. 6, 1–55. https://doi.org/10.1080/10705519909540118.

Jakobsen, I.S., Horwood, L.J., Fergusson, D.M., 2012. Childhood anxiety/withdrawal, adolescent parent–child attachment and later risk of depression and anxiety disorder. J. Child Fam. Stud. 21, 303–310. https://doi.org/10.1007/s10826-011-9476-x.

Johnson, J.G., Smailes, E., Cohen, P., Kasen, S., Brook, J.S., 2004. Anti-social parental behaviour, problematic parenting and aggressive offspring behaviour during adulthood: a 25-year longitudinal investigation. Br. J. Criminol. 44, 915–930. https://doi.org/10.1093/bjc/azh041.

Jorm, A.F., Dear, K.B.G., Rodgers, B., Christensen, H, 2003. Interaction between mother's and father's affection as a risk factor for anxiety and depression symptoms. Evidence for increased risk in adults who rate their father as having been more affectionate than their mother. Soc. Psychiatry Psychiatr. Epidemiol. 38, 173–179. https://doi.org/10.1007/s00127-003-0620-9.

Kessler, R.C., Andrews, G., Mroczek, D., Ustun, B., Wittchen, H.-U., 1998. The World Health Organization Composite International Diagnostic Interview short-form (CIDI-SF). Int. J. Methods Psychiatr. Res. 7, 171–185. https://doi.org/10.1002/mpr.47.

Kessler, R.C., Berglund, P., Demler, O., Jin, R., Koretz, D., Merikangas, K.R., Wang, P.S., 2003. The epidemiology of major depressive disorder: results from the National Comorbidity Survey Replication (NCS-R). JAMA 289, 3095–3105. https://doi.org/10.1001/jama.289.23.3095.

In Kline, R.B., 2016a. Chapter 12: global fit testing, Ed.. In: Kline, R.B. (Ed.), Principles and Practice of Structural Equation Modeling, 4th ed. The Guilford Press, New York, pp. 262–299.

In Kline, R.B., 2016b. Chapter 11: estimation and local fit testing (Ed.). In: Kline, R.B. (Ed.), Principles and Practice of Structural Equation Modeling, 4th ed. The Guilford Press, New York, pp. 231–261.

Lerner, D., Henke, R.M., 2008. What does research tell us about depression, job performance, and work productivity? J. Occup. Environ. Med. 50, 401–410. https://doi.org/10.1097/JOM.0b013e31816bae50.
Mathers, C.D., Loncar, D., 2006. Projections of global mortality and burden of disease from 2002 to 2030. PLoS Med. 3, e442. https://doi.org/10.1371/journal.pmed.0030442.
McDonald, R.P., Marsh, H.W., 1990. Choosing a multivariate model: noncentrality and goodness of fit. Psychol. Bull. 107, 247–255. https://doi.org/10.1037/0033-2909.107.2.247.
Michiels, D., Grietens, H., Onghena, P., Kuppens, S., 2010. Perceptions of maternal and paternal attachment security in middle childhood: links with positive parental affection and psychosocial adjustment. Early Child Dev. Care 180, 211–225. https://doi.org/10.1080/03004430903415064.
Möller, K., Stattin, H., 2001. Are close relationships in adolescence linked with partner relationship in midlife? A longitudinal, prospective study. Int. J. Behav. Dev. 25 (1), 69–77. https://doi.org/10.1080/01650250042000087.
Moussavi, S., Chatterji, S., Verdes, E., Tandon, A., Patel, V., Ustun, B., 2007. Depression, chronic diseases, and decrements in health: results from the World Health Surveys. Lancet 370, 851–858. https://doi.org/10.1016/S0140-6736(07)61415-9.
Muñoz, R.F., Cuijpers, P., Smit, F., Barrera, A.Z., Leykin, Y., 2010. Prevention of major depression. Annu. Rev. Clin. Psychol. 6, 181–212. https://doi.org/10.1146/annurev-clinpsy-033109-132040.
Newman, M.G., Castonguay, L.G., Jacobson, N.C., Moore, G.A., 2015. Adult attachment as a moderator of treatment outcome for generalized anxiety disorder: comparison between cognitive–behavioral therapy (CBT) plus supportive listening and CBT plus interpersonal and emotional processing therapy. J. Consult. Clin. Psychol. 83, 915–925. https://doi.org/10.1037/a0039359.
Nezu, A.M., Perri, M.G., 1989. Social problem-solving therapy for unipolar depression: an initial dismantling investigation. J. Consult. Clin. Psychol. 57, 408–413. https://doi.org/10.1037/0022-006X.57.3.408.
Olufowote, R.A.D., Soloski, K.L., Gonzalez-Casteñeda, N., Hayes, N.D, 2020. An accelerated latent class growth curve analysis of adolescent bonds and trajectories of depressive symptoms. J. Child Fam. Stud. 29, 292–306. https://doi.org/10.1007/s10826-019-01542-1.
Overbeek, G., ten Have, M., Vollebergh, W., de Graaf, R., 2007. Parental lack of care and overprotection. Soc. Psychiatry Psychiatr. Epidemiol. 42, 87–93. https://doi.org/10.1007/s00127-006-0115-6.
Paradis, A.D., Reinherz, H.Z., Giaconia, R.M., Beardslee, W.R., Ward, K., Fitzmaurice, G. M., 2009. Long-term impact of family arguments and physical violence on adult functioning at age 30 years: findings from the simmons longitudinal study. J. Am. Acad. Child Adolesc. Psychiatry 48, 290–298. https://doi.org/10.1097/CHI.0b013e3181948fdd.
Preacher, K.J., Kelley, K., 2011. Effect size measures for mediation models: quantitative strategies for communicating indirect effects. Psychol. Methods 16, 93–115. https://doi.org/10.1037/a0022658.
Proulx, C.M., Helms, H.M., Buehler, C., 2007. Marital quality and personal well-being: a meta-analysis. J. Marriage Fam. 69, 576–593. https://doi.org/10.1111/j.1741-3737.2007.00393.x.
Radler, B.T., Ryff, C.D., 2010. Who participates? Accounting for longitudinal retention in the MIDUS National Study of Health and Well-Being. J. Aging Health 22, 307–331. https://doi.org/10.1177/0898264309358617.
Rohner, R.P., Britner, P.A., 2002. Worldwide mental health correlates of parental acceptance-rejection: review of cross-cultural and intracultural evidence. Cross Cult Res. 36, 16–47. https://doi.org/10.1177/106939710203600102.
Rohner, R.P., 2008. Parental acceptance-rejection theory studies of intimate adult relationships. Cross-Cultural Research 42, 5–12. https://doi.org/10.1177/1069397107309749.
Rosseel, Y., 2012. Lavaan: an R package for structural equation modeling. J. Stat. Softw. 48, 1–36. https://doi.org/10.18637/jss.v048.i02.
Rossi, A.S., 2001. Caring and Doing For Others: Social responsibility in the Domains of Family, Work, and Community. University of Chicago Press, Chicago.
Ryff, C., Almeida, D.M., Ayanian, J., Carr, D.S., Cleary, P.D., Coe, C., Williams, D., 2017a. Midlife in the United States (MIDUS 2), 2004-2006. ICPSR04652-v7. Inter-university Consortium for Political and Social Research [distributor], Ann Arbor, MI. https://doi.org/10.3886/ICPSR04652.v7, 2017-11-20.
. . . Ryff, C.D., Almeida, D.M., Ayanian, J., Binkley, N., Carr, D.B., Coe, C., Williams, D., 2017b. National Survey of Midlife Development in the United States (MIDUS 3), 2013-2014. Midlife in the United States (MIDUS 3), 2013-2014. ICPSR36346-v5. Inter-university Consortium for Political and Social Research [distributor], Ann Arbor, MI, 2017-03-09.
Ryff, C.D., Lachman, M.E., 2017. National Survey of Midlife Development in the United States (MIDUS II): cognitive Project, 2004-2006. ICPSR25281-v5. Inter-university Consortium for Political and Social Research [distributor], Ann Arbor, MI, 2013-04-29.
Ryff, C.D., & Lachman, M.E. (2018). Midlife in the United States (MIDUS 3): cognitive project, 2013-2017. doi:10.3886/ICPSR37095.v1.
Salvatore, J.E., Haydon, K.C., Simpson, J.A., Collins, W.A., 2013. The distinctive role of romantic relationships in moderating the effects of early caregiving on adult anxious-depressed symptoms over 9 years. Dev. Psychopathol. 25, 843–856. https://doi.org/10.1017/S0954579413000205.
Schmidt, C.D., Gelhert, N.C., 2017. Couples therapy and empathy: an evaluation of the impact of imago relationship therapy on partner empathy levels. Fam. J. 25, 23–30. https://doi.org/10.1177/1066480716678621.
Steiger, J.H., 1990. Structural model evaluation and modification: an interval estimation approach. Multivar. Behav. Res. 25, 173–180. https://doi.org/10.1207/s15327906mbr2502_4.
Tucker, L.R., Lewis, C., 1973. A reliability coefficient for maximum likelihood factor analysis. Psychometrika 38, 1–10. https://doi.org/10.1007/BF02291170.
Vangelisti, A.L., Maguire, K.C., Alexander, A.L., Clark, G., 2007. Hurtful family environments: links with individual, relationship, and perceptual variables. Commun. Monogr. 74, 357–385. https://doi.org/10.1080/03637750701543477.
. . . Watson, K.H., Dunbar, J.P., Thigpen, J., Reising, M.M., Hudson, K., McKee, L., Compas, B.E., 2014. Observed parental responsiveness/warmth and children's coping: cross-sectional and prospective relations in a family depression preventive intervention J. Fam. Psychol. 28, 278–286. https://doi.org/10.1037/a0036672.
Weich, S., Patterson, J., Shaw, R., Stewart-Brown, S., 2009. Family relationships in childhood and common psychiatric disorders in later life: systematic review of prospective studies. Br. J. Psychiatry 194, 392–398. https://doi.org/10.1192/bjp.bp.107.042515.
Wen, Z., Fan, X., 2015. Monotonicity of effect sizes: questioning kappa-squared as mediation effect size measure. Psychol. Methods 20, 193–203. https://doi.org/10.1037/met0000029.
Whisman, M.A., Uebelacker, L.A., 2009. Prospective associations between marital discord and depressive symptoms in middle-aged and older adults. Psychol. Aging 24, 184–189. https://doi.org/10.1037/a0014759.
. . . Whiteford, H.A., Degenhardt, L., Rehm, J., Baxter, A.J., Ferrari, A.J., Erskine, H.E., Vos, T., 2013. Global burden of disease attributable to mental and substance use disorders: findings from the global burden of disease study 2010 Lancet 382, 1575–1586. doi:10.1016/S0140-6736(13)61611-6.
Yap, M.B.H., Pilkington, P.D., Ryan, S.M., Jorm, A.F, 2014. Parental factors associated with depression and anxiety in young people: a systematic review and meta-analysis. J. Affect. Disord. 156, 8–23. https://doi.org/10.1016/j.jad.2013.11.007.
Young, J.F., Mufson, L., Davies, M., 2006. Efficacy of interpersonal psychotherapy-adolescent skills training: an indicated preventive intervention for depression. J. Child Psychol. Psychiatry 47, 1254–1262. https://doi.org/10.1111/j.1469-7610.2006.01667.x.
Zainal, N.H., Newman, M.G., 2018. Worry amplifies theory-of-mind reasoning for negatively valenced social stimuli in generalized anxiety disorder. J. Affect. Disord. 227, 824–833. https://doi.org/10.1016/j.jad.2017.11.084.
Zainal, N.H., Newman, M.G., 2021. Within-person increase in pathological worry predicts future depletion of unique executive functioning domains. Psychol. Med. https://doi.org/10.1017/S0033291720000422.
Zainal, N.H., Newman, M.G., 2021. Larger increase in trait negative affect is associated with greater future cognitive decline and vice versa across 23 years. Depress. Anxiety 38, 146–160. https://doi.org/10.1002/da.23093.
Zainal, N.H., Newman, M.G., 2021. Depression and worry symptoms predict future executive functioning impairment via inflammation. Psychol. Med. https://doi.org/10.1017/S0033291721000398. In press.
Zhong, X., Yuan, K.-.H., 2011. Bias and efficiency in structural equation modeling: maximum likelihood versus robust methods. Multivar. Behav. Res. 46, 229–265. https://doi.org/10.1080/00273171.2011.558736.