Research paper

Attachment and social support mediate the association between childhood maltreatment and depressive symptoms

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ABSTRACT

Objective: To examine attachment insecurity and low social support as potential mediators of the association between childhood maltreatment (CM) types and depression severity in patients with a lifetime history of major depressive disorders (MDD).
Method: Participants with an acute or remitted MDD (*N* = 580) completed questionnaires about CM (Childhood Trauma Questionnaire), attachment (Relationship Scales Questionnaire), social support (Social Support Questionnaire), and depression severity (Beck Depression Inventory). Mediation and path models with CM types as independent variables, attachment avoidance and anxiety as mediators and depression severity as dependent variable were calculated. In addition, a sequential mediation model with attachment insecurity and social support as mediators of the association between CM and depression was tested.
Results: Attachment avoidance and anxiety partially mediated the effect of CM on depression. In the path model including the different CM types, there were significant indirect effects of emotional abuse on depression via attachment anxiety and of emotional neglect on depression via attachment avoidance. Results also supported the hypothesized sequential mediation via attachment insecurity and social support.
Limitations: A cross-sectional design with a retrospective self-report measure of CM was used and the developmental timing of exposure to CM was not considered.
Conclusion: Our findings suggest that the effect of emotional abuse and emotional neglect on depression is partially mediated by attachment avoidance and anxiety. Further, the results support the hypothesis of a sequential mediation via attachment insecurity and social support. Accordingly, attachment insecurity is discussed as a target of psychotherapy for patients with MDD and CM.

1. Introduction

The direct relationship between childhood maltreatment (CM) and adult depressive psychopathology has been documented consistently (Infurna et al., 2016; Mandelli et al., 2015; Nelson et al., 2017). However, the psychological mechanisms and mediating variables of this relationship are still under debate. Research considering these mechanisms might help to improve tailoring psychotherapies to the individual needs of patients. One variable that has been identified as a promising mediator in previous studies is the attachment style (Hankin, 2005; Schierholz et al., 2016).

Attachment theory was first described by John Bowlby and further researched in observational and laboratory studies by Mary Ainsworth (Ainsworth et al., 2015; Bowlby, 1988). According to Bowlby, the attachment system is an inborn device that is activated by perceived threats and causes infants to seek proximity to an attachment figure

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(e.g. the parents), a behavior adaptive to survival. However, people develop their individual "working models" building upon experiences with attachment-figures and allowing them to predict future interactions through life (Bowlby, 1988). When attachment figures in early childhood are available, sensitive and responsive to the infant's proximity-seeking attempts, the infant is likely to develop a secure attachment style and to use attachment-figures as "safe haven" in times of distress, and as "secure base" in times of exploration. However, when attachment-figures are unavailable or unresponsive, infants do not experience that their proximity-seeking results in a reduction of distress (Bowlby, 1988). To cope with the unavailability of attachment-figures, they either use *hyperactivating* strategies (intensifying proximity-seeking attempts) or *deactivating* strategies (giving up proximity-seeking efforts) (Mikulincer and Shaver, 2003).

Insights of the attachment theory have also been transferred to adult romantic relationships. Adult attachment can be conceptualized in a model with two continuous dimensions: attachment anxiety and attachment avoidance (Mikulincer and Shaver, 2003). Attachment anxiety in romantic relationships is characterized e.g. by constant monitoring of the partner, strong efforts to maintain proximity, overdependence, and clinging behaviors (corresponding to *hyperactivating* strategies). On the other hand, avoidance is characterized e.g. by avoiding intimacy, interdependence, self-disclosure and a reluctance to confront relational conflicts (corresponding to *deactivating* strategies) (Mikulincer and Shaver, 2003). Low levels of attachment anxiety and avoidance correspond to attachment security. There is also initial evidence for differences in automatic brain reactivity to social signals, consistent with behavioral deactivating (for attachment avoidance) and hyperactivating (for attachment anxiety) strategies (Donges et al., 2012; Suslow et al., 2009). Moreover, while attachment avoidance might be negatively associated with gray matter volume in structures related to interoception and subjective feeling states, attachment anxiety might be positively associated with it (Acosta et al., 2018).

In a large number of cross-sectional and prospective studies, attachment insecurity – particularly anxious and less consistently avoidant attachment – was related to neuroticism, negative affectivity, depressive symptoms, and the onset of depressive episodes in non-clinical, high-risk as well as clinical samples (Eberhart and Hammen, 2006; Hankin et al., 2005; Mikulincer and Shaver, 2007). This is supported by a recent meta-analysis reporting significantly higher levels of depressive symptoms in individuals with insecure-preoccupied attachment style (high in attachment anxiety) but not in individuals with insecure-dismissing attachment style (high in attachment avoidance) compared with securely attached individuals (Dagan et al., 2018). Mikulincer and Shaver (2012) suggest that attachment insecurity reduces resilience in coping with stressful life events and therefore should be viewed as a general risk factor for mental disorders.

1.1. Attachment as a mediator between childhood maltreatment and depression

So far, only a few studies have considered attachment as a possible mediator of the effect of CM on the severity of depression. In non-clinical community or high-risk samples, attachment significantly mediated the effect of CM on psychological distress (Dion et al., 2019), internalizing symptoms (Muller et al., 2012) and depression (Bifulco et al., 2006; Hankin, 2005; Widom et al., 2018). However, in two of these studies, only attachment anxiety - and not avoidance - was identified as a significant mediator (Dion et al., 2019; Widom et al., 2018), while another study reported that both fearful (high avoidance and high anxiety) and angry-dismissive (high avoidance) attachment mediated the effect (Bifulco et al., 2006). Consequently, findings concerning the different attachment dimensions as mediators are inconsistent in non-clinical samples. Only one study so far looked at the indirect effect of CM on depression severity through attachment in a sample of patients with depression (Schierholz et al., 2016). They

reported that avoidance in close relationships, emotion dysregulation, and a depressogenic attributional style conjointly mediated the relationship between CM and depression severity. However, in this study, avoidance was not identified as a specific mediator (Schierholz et al., 2016). Another study using a clinical sample found that attachment mediated the effect between interpersonal trauma (not restricted to CM) and depression severity (Fowler et al., 2013).

1.2. Types of childhood maltreatment, attachment, and depression

In this study, we consider five types of CM: emotional abuse, sexual abuse, physical abuse, and emotional as well as physical neglect (Butchart et al., 2006). A model developed by Riggs proposes that, in particular, emotional abuse by attachment figures in infancy and early childhood contributes to the development of insecure attachment organizations (Riggs, 2010). The model suggests that insecure attachment organization, in turn, leads to consequential problems, such as emotion regulation deficits, negative internal working models of self and others, deficits in social functioning and poor peer and adult romantic relationships which are, in turn, risk factors for psychopathology (Riggs, 2010). Empirical research supports the assumption that emotional maltreatment, in particular, contributes to insecure attachment. When all five types of CM were included concurrently in a sample of college students, only emotional abuse and emotional neglect predicted attachment to mothers and fathers (Lowell et al., 2014). In another study using a sample of university students, psychological maltreatment (synonymous with emotional maltreatment), physical maltreatment, and exposure to family violence were considered simultaneously as predictors in a mediation model with attachment as mediator and symptomatology as outcome variables (Muller et al., 2012). Only the indirect effect of psychological maltreatment on symptomatology through attachment remained significant, underlining the special role of emotional or psychological abuse and neglect (Muller et al., 2012). We, therefore, developed a path model including all CM types concurrently as predictors, anxious and avoidant attachment as mediators and depression severity as outcome variable. Based on the studies mentioned we hypothesized that only the effect of emotional abuse and emotional neglect on depression is mediated by attachment insecurity.

1.3. Sequential mediation model with social support

There are different possible pathways leading from attachment insecurity to depressive symptoms. One possible mechanism is, that attachment insecurity leads to more problems in interpersonal relationships and therefore to a poorer social network and less perceived social support. Initial findings indicate that a) attachment is a mediator in the relationship between CM and poorer perceived social support (Muller et al., 2008) and b) poorer perceived social support is a mediator in the relationship between attachment and psychopathology (Cloitre et al., 2008). Combining these individual results yields a sequential mediation model with attachment insecurity and poorer perceived social support as mediators of the relationship between CM and depression severity.

1.4. Aims of this study

First, we hypothesize that anxious and avoidant attachment mediates the relationship between CM and depressive symptoms in patients with acute or remitted MDD. Next, we consider different types of CM (emotional abuse, sexual abuse, physical abuse, emotional neglect and physical neglect) concurrently in a path model with CM types as predictors, anxious and avoidant attachment as mediators and depression severity as outcome. Based on previous findings, we hypothesize that only the effect of emotional abuse and emotional neglect on depression severity is mediated by attachment insecurity. Last, we test the proposed sequential mediation model with attachment insecurity and

poorer perceived social support as sequential mediators of the relationship between CM and depression severity.

2. Methods

2.1. Participants and procedure

Data for these analyses were drawn from the FOR 2107 research project, an ongoing multicenter study examining environmental and genetic risk factors and their interaction involved in the onset, etiology, and course of various mental disorders (http://for2107.de). A detailed study description is presented in a previous article (Kircher et al., 2018). Participants were recruited via public advertisements and from inpatient services at the Universities of Marburg and Münster. Inclusion criteria for all participants were a verbal IQ above 80, Western European ancestry, magnetic resonance imaging compatibility, and no history of severe neurological or medical disorders. Additional inclusion criteria for the MDD patient group examined in this study were an acute, partially remitted or remitted diagnosis of MDD assessed with SCID-I interviews (Wittchen et al., 1997) by trained psychologists.

All participants gave written informed consent. The FOR2107 cohort project (WP1) was approved by the Ethics Committees of the Medical Faculties, University of Marburg (AZ: 07/14) and University of Münster (AZ: 2014-422-b-S).

Of the $N = 629$ participants which met inclusion and exclusion criteria, 49 were excluded due to missing data in at least one of the questionnaires. The resulting sample consisted of 580 individuals with an acute (47%), partially remitted (27%), or remitted (26%) major depressive disorder. 62% of the participants were female and 38% male. They were 18 – 65 years old, with an average age of 37.2 years ($SD = 13.4$). The mean total education was 13.0 years. 32.2% of the participants lived alone, 37.7% with a partner, and 30.1% in some other form of cohabitation. 12.8 % were currently unemployed, 22.9% were working full-time, 13.6% part-time, 27.8% were currently undergoing training/studies, and 9.5% were retired. Patients with acute, partly remitted, and fully remitted depression did not differ with respect to age and living situation. Patients with fully remitted depression were more highly educated and less often unemployed than patients with acute depression. Participants had a median of two lifetime depressive episodes and a mean number of 1.7 inpatient treatments. 10.7 percent of the participants currently had a depressive episode that had lasted at least 24 months (chronic course). The mean measures of CM, attachment, perceived social support, and depression severity are presented in table 1.

2.2. Depressive Symptoms

The presence of a current or lifetime diagnosis of an MDD was assessed with the Structured Clinical Interview for DSM-IV (SCID I; Wittchen et al., 1997) by trained psychologists. The severity of depressive symptoms was measured by self-report using the Beck Depression Inventory (BDI), assessing with 21 Items the severity of depression in the last week (Hautzinger et al., 1995). In the present study, the internal consistency of the BDI was α = .91.

2.3. Childhood maltreatment

Self-reported CM was assessed retrospectively by the 28-item version of the Childhood Trauma Questionnaire (CTQ-SF; Bernstein et al., 2003, German version: Wingenfeld et al., 2010). The CTQ measures five forms of CM experienced during childhood and adolescence: emotional abuse (α=0.86), physical abuse (α=0.82), sexual abuse (α=0.93), emotional neglect (α=0.91), and physical neglect (α=0.63, all α in this sample). The response options range from 1 (= *never true*) to 5 (= *very often true*). To indicate the severity level of CM, we applied the cutoff values established by Bernstein and Fink (Bernstein and Fink, 1998).

2.4. Adult Attachment

Adult attachment was measured by the 30-item version of the Relationship Scales Questionnaire (RSQ; Griffin and Bartholomew, 1994; German Version: Steffanowski et al., 2001). Confirmatory factor analyses suggest that a two-dimension model with the dimensions avoidance (e.g. "I worry about others getting too close to me.") and anxiety (e.g. "I often worry that romantic partners don't really love me.") is the best-fitting model (Kurdek, 2002; Roisman et al., 2007). Sum scores of these scales were computed according to this model (avoidance items: 10, 12, 13, 15, 20, 24, 29, 30, with α = .74; anxiety items: 11, 18, 21, 23, 25, with α = .81 in this sample).

2.5. Perceived Social Support

Perceived social support was measured by the 22-item version of a widely used German self-report instrument, the Social Support Questionnaire (F-SozU) (Fydrich et al., 2007). The questionnaire measures the subjective conviction to receive support and resources from the social network if necessary (Fydrich et al., 2007). The questionnaire consists of the three subscales emotional support, instrumental support, and social integration. A global score can be computed and is used in this study (α = 0.87 in this sample).

2.6. Statistical Analyses

First, bivariate Pearson correlations were calculated for variables of interest with SPSS 25.0. To examine the hypothesized mediation with CM as the independent variable, the two attachment dimensions (avoidance/anxiety) as mediators and depression severity as dependent variable, a mediation analysis using the PROCESS Macro (Hayes, 2017; Model 4) for SPSS was performed. To test the statistical significance of

Table 1

Means, standard deviations, and bivariate correlations between severity of childhood maltreatment types, proposed mediators, and depression severity.

Variable	M	SD	1	2	3	4	5	6	7	8	9
1. Childhood Maltreatment	46.29	16.01	1								
2. Emotional Abuse	11.25	5.21	.87***	1							
3. Physical Abuse	7.10	3.37	.78***	.61***	1						
4. Sexual Abuse	6.37	3.23	.53***	.32***	.40***	1					
5. Emotional Neglect	13.46	5.37	.87***	.72***	.55***	.25***	1				
6. Physical Neglect	8.11	3.18	.78***	.55***	.55***	.29***	.67***	1			
7. Attachment Avoidance	2.89	0.71	.32***	.27***	.18***	.17***	.34***	.24***	1		
8. Attachment Anxiety	2.60	1.02	.16***	.20***	.09*	.02	.14**	.11*	.23***	1	
9. Social Support[a]	3.66	0.92	−.35***	−.30***	−.17***	−.04	−.44***	−.30***	−.49***	−.31***	1
10. Depression (BDI)	18.40	11.34	.32***	.29***	.24***	.15***	.29***	.23***	.42***	.35***	−.53***

Note. N = 580; BDI = Beck Depression Inventory; HAMA = Hamilton Anxiety Scale. [a] n = 577; *p<0.05; **p<0.01; ***p<0.001.

the indirect effects, we used bias-corrected 95% bootstrap confidence intervals based on 5000 bootstrap samples. Subsequently, to test specific effects of the five CM types, two path models were calculated with SPSS AMOS 25 (Arbuckle, 2017). The five CM types (emotional abuse, physical abuse, sexual abuse, emotional neglect, physical neglect) were included as independent variables, the two attachment dimensions (anxiety, avoidance) again as mediators, and depression severity as dependent variable. In the first path analysis, we followed an explorative approach and allowed all correlations between the five CM types, all direct effects of CM types on depression severity and all indirect effects of CM types on depression severity via anxiety and avoidance in close relationships (saturated model, Fig. 2). Next, we tested a more restrictive model because we hypothesized that only the effects of emotional abuse and emotional neglect on depression severity were mediated by attachment. We included the same independent variables, dependent variable, and mediators as in the first path analysis, but we constrained the direct paths from physical abuse, sexual abuse and physical neglect to avoidance and anxiety to zero (theoretical model, Fig. 3). To compute bootstrap confidence intervals for the specific indirect effects via anxiety and avoidance in close relationships, the lavaan package in R was used (R Core Team, 2019; Rosseel, 2012). Finally, the hypothesized sequential mediation model with CM as independent variable, attachment insecurity as first mediator, perceived social support as subsequent mediator, and depression severity as dependent variable was tested (Fig. 4) using again the PROCESS Macro (Hayes, 2017; Model 6) for SPSS.

3. Results

3.1. Descriptive analyses and bivariate correlations

Table 1 presents the means and standard deviations of the variables, as well as zero-order correlations among the variables included in this study. 57.1 % of the participants reported that they have experienced at least moderate to severe CM in at least one CM type, according to the cutoff values established by Bernstein and Fink (Bernstein and Fink, 1998). The BDI scores ranged from 0 to 52 with a mean score of 18.4 (SD = 11.34) indicating on average mild to moderate depression severity. CM correlated with depression severity and attachment avoidance with moderate effect sizes and with attachment anxiety with a small effect size. Attachment avoidance and anxiety correlated with depression severity with a moderate to large effect size. All CM types correlated with each other at least with a moderate effect size, often with large effect sizes (Table 1).

Additional correlational analyses between demographic variables (age, years of education, living situation, and employment) and the independent variable (CM), the mediators (attachment anxiety, attachment avoidance, social support), and dependent variable (depression severity) in our models, resulted in the following significant correlations: age was negatively associated with attachment anxiety (r = –.23), years of education were positively associated with social support (r = .08) and negatively with CM (r = –.18) and depression severity (r = –.15). Living alone was positively associated with attachment avoidance (r = .12) and attachment anxiety (r = .11) and negatively with social support (r = –.19). There was a positive association between unemployment and depression severity (r = .14).

3.2. Mediation model

Results provided support for the hypothesized mediation model (Fig. 1). Specifically, greater CM scores significantly predicted higher depression, b = 0.27, 95% CI [0.20, 0.33]. Greater CM also predicted higher avoidance in close relationships, b = 0.36, 95% CI [0.27, 0.44] and higher anxiety in close relationships, b = 0.25, 95% CI [0.12, 0.38]. Avoidance and anxiety in close relationships were also significant predictors of depression when controlling for CM, avoidance:

b = 0.23, 95% CI [0.17, 0.29], anxiety: b = 0.13, 95% CI [0.10, 0.17]. There were also significant indirect effects of CM on depression via avoidance, b = 0.08, 95% CI [0.05, 0.11], β = 0.10, CI [0.06, 0.13] and via anxiety in close relationships b = 0.03, 95% CI [0.02, 0.05], β = 0.04, 95% CI [0.02, 0.06]. The direct effect of CM on depression still remained significant after including the mediators, b = 0.15, 95% CI [0.09, 0.21], supporting a partial mediation model.

Owing to significant associations between years of education and CM as well as depression severity, we conducted a sensitivity analysis with correction for years of education. This yielded in only marginal changes of coefficients with all paths remaining significant.

3.3. Path model

We calculated the two path analyses (saturated and theoretical model) as described above. Fig 2. shows the significant standardized path coefficients of the saturated model and Fig 3. of the theoretical model.

The goodness-of-fit indices suggest that the theoretical model (Fig. 3) adequately fits the data, CFI = 0.998, RMSEA = 0.028. The model fit of the theoretical model is not significantly worse than that of the saturated model, χ^2 (6, N = 580) = 8.76, p = 0.19, while the AIC – that takes into account the parsimony of a model – indicates a better fit of the theoretical model (AIC = 84.76) when compared to the saturated model (AIC = 88.00). In the theoretical model, the total indirect effect of emotional abuse on depression severity via anxiety and avoidance in close relationships was significant, β = 0.07, 95% CI [0.02, 0.12]. This was mainly accounted for by the specific indirect effect via anxiety in close relationships, β = 0.05, 95% CI [0.02, 0.08] while the specific indirect effect via avoidance in close relationships was not significant β = 0.01, 95% CI [–0.02, 0.05]. The total indirect effect of emotional neglect on depression severity via anxiety and avoidance in close relationships was significant, β = 0.09, 95% CI [0.04, 0.15]. This was mainly accounted by the specific indirect effect via avoidance in close relationships, β = 0.09, 95% CI [0.05, 0.14], while the specific indirect effect via anxiety in close relationships was not significant, β = –0.001, 95% CI [–0.03, 0.03]. There were no significant direct effects from the CM types on depression severity. In the saturated model, the same paths were significant and, in addition, there was a significant path from sexual abuse on avoidance.

3.4. Sequential mediation model

Results provided support for the hypothesized sequential mediation model with CM as the independent variable, attachment insecurity as first mediator, perceived social support as subsequent mediator, and depression severity as dependent variable. Standardized path coefficients are presented in Fig. 4. There was a significant sequential indirect effect of CM on depression with insecure attachment as first mediator and perceived social support as second mediator, β = 0.04, 95% CI [0.03, 0.06]. The two indirect effects with a single mediator were also significant, via insecure attachment β = 0.08, 95% CI [0.05, 0.11]; via perceived social support β = 0.08, 95% CI [0.05, 0.12]. The direct effect of CM on depression still remained significant after including the mediators, β = 0.11, p = .002, supporting a partial mediation model.

Despite significant associations between the demographic variable living alone, insecure attachment and social support, we decided for theoretical reasons not to control for the variable living alone. Living alone might be a further consequence of insecure attachment, hence being a possible mediator of the link between insecure attachment and social support, instead of a confounding variable.
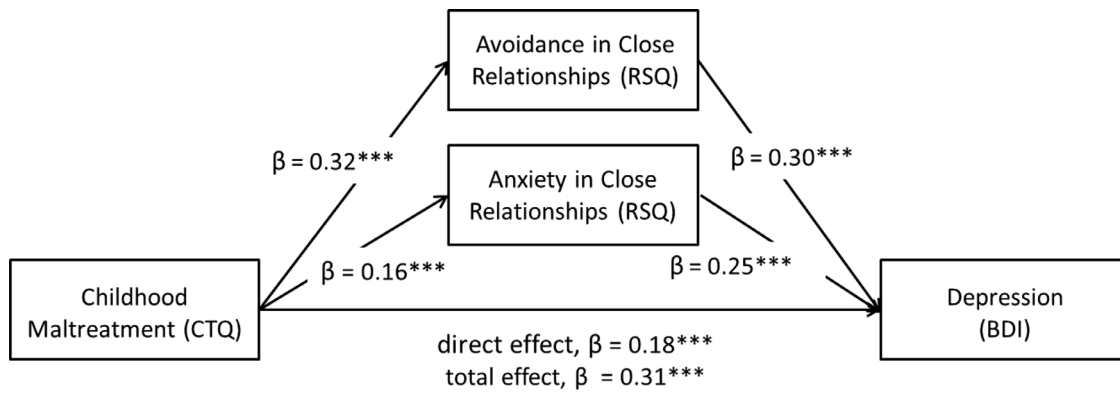
Fig. 1. Model of childhood maltreatment as a predictor of depression severity mediated by attachment types. Unstandardized coefficients are reported for each path. RSQ = Relationship Scales Questionnaire; CTQ = Childhood Trauma Questionnaire; BDI = Beck Depression Inventory. ***p < .001.
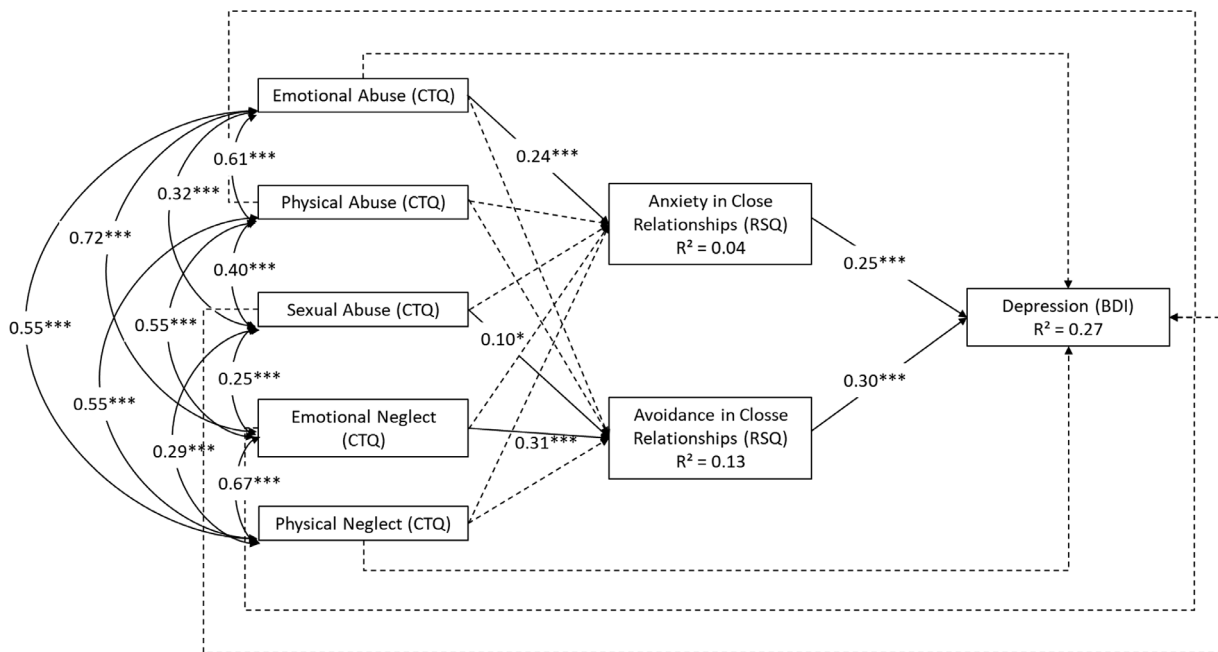

Fig. 2. Saturated model of childhood maltreatment types as predictors of depression severity mediated by attachment types. Standardized coefficients are reported. Solid paths are significant paths, dotted lines are not significant. RSQ = Relationship Scales Questionnaire; CTQ = Childhood Trauma Questionnaire; BDI = Beck Depression Inventory. ***p < .001, ** p < .01, *p < .05.

4. Discussion

4.1. Main findings

We could replicate the finding of studies with non-clinical samples that insecure attachment mediates the relationship between CM and depressive symptoms in a sample of patients with acute or remitted MDD reporting on average mild to moderate depression severity. However, in contrast to most of the studies with non-clinical samples (Dion et al., 2019; Widom et al., 2018), in this study, not only anxiety but also avoidance in close relationships mediated the effect of CM on depressive symptoms. In addition, our findings indicate that, in particular, the effect of emotional abuse and emotional neglect on depression severity is mediated by attachment insecurity. We found two specific indirect effects: the effect of emotional abuse via anxiety in close relationships on depression severity and the effect of emotional neglect via avoidance in close relationships on depression severity. Moreover, our findings support the proposed sequential mediation

model with attachment insecurity and poorer perceived social support as sequential mediators of the relationship between CM and depression severity.

4.2. Emotional neglect and emotional abuse as predictors of attachment insecurity and depression

The findings of this study indicate that relative to other types of CM, emotional maltreatment (abuse and neglect) in particular predicts insecure attachment. This is in accordance with theories highlighting the role of emotional maltreatment in causing insecure attachment (Riggs, 2010) and with empirical findings indicating that there is a particularly strong relationship between emotional maltreatment and insecure attachment when compared with other types of CM (Lowell et al., 2014; Muller et al., 2012). To our knowledge, the two specific indirect effects we found in our path model (1.: emotional abuse – anxiety – depression; 2.: emotional neglect – avoidance – depression) have not been shown this way before. One possible
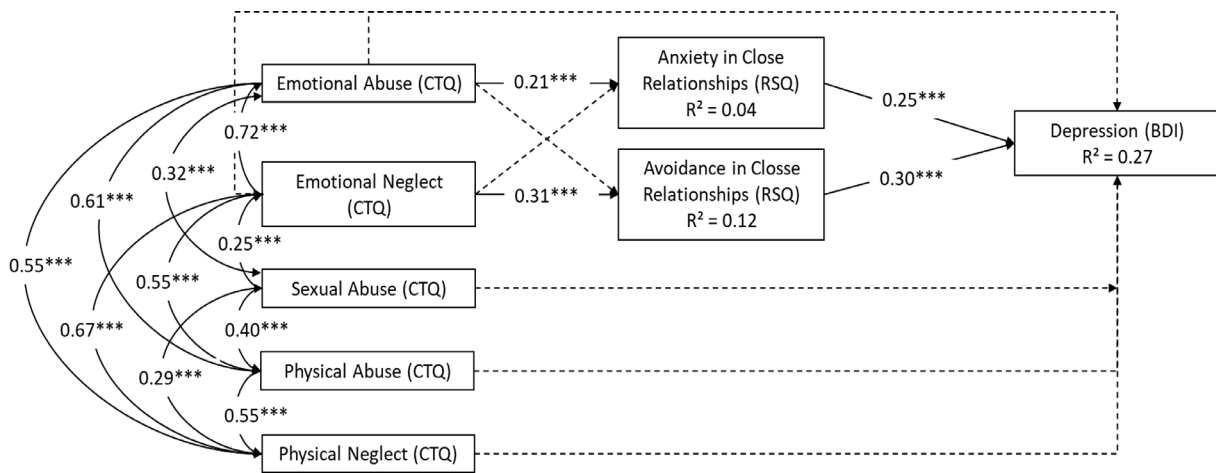
Fig. 3. Theoretical model of emotional abuse and emotional neglect as predictors of depression severity mediated by attachment types. Standardized coefficients are reported for each significant path. RSQ = Relationship Scales Questionnaire; CTQ = Childhood Trauma Questionnaire; BDI = Beck Depression Inventory. ***p < .001, ** p < .01, *p < .05.

explanation for these specific paths might be the degree of inconsistency and ambivalence in caregiving. Attachment theory holds that inconsistent responsiveness and availability of primary attachment figures results more likely in a negative working model of the self and in an anxious attachment style. In contrast, consistently unresponsive, rejecting or neglecting caregiving is associated with a negative working model of others and a more avoidant attachment style (Ainsworth, 1984; Mallinckrodt and Wei, 2005). Most of the items of the CTQ measuring emotional neglect are focusing more on enduring and general experiences of neglect (e.g. "I felt loved" (R)). In contrast, exposure to emotional abuse – as measured in the CTQ and controlled for the effects of emotional neglect – might occur more frequently in an ambivalent and inconsistent manner (e.g. "People in my family said hurtful or insulting things to me."), alternating with phases of more responsive caregiving, therefore resulting in more anxious attachment in the child. Moreover, previous evidence suggests that avoidant attachment in mothers is associated with emotionally neglectful parenting (Strathearn, 2011) and that there exists an intergenerational transition of attachment via multiple pathways, as caregiver sensitivity, autonomy support (Verhage et al., 2016) and via changes in the oxytocinergic and dopaminergic system associated with attachment (Strathearn, 2011). However, the occurrence of emotional neglect and emotional abuse is highly correlated, so that the specific effects should be interpreted with caution. Yet, our findings support the assumption that attachment particularly mediates the effect of emotional maltreatment (neglect and abuse) on depression.

4.3. Sequential mediation with perceived social support

The finding of the current study supporting the hypothesized sequential model with attachment and perceived social support as mediators of the effect of CM on depression is consistent with assumptions of attachment theory and previous findings. According to attachment theory, attachment insecurity is associated with behaviors that inhibit positive social interactions and healthy adult relationships. Anxiously attached individuals are assumed to use more often hyperactivating strategies – as clinging and controlling behaviors or intense demands for attention – which hinder the formation of mature reciprocal relationships and cause chronic frustration and catastrophic appraisals of interpersonal conflicts (Mikulincer and Shaver, 2003). Avoidantly attached individuals are assumed to use deactivating strategies – as avoiding intimacy, interdependence, and self-disclosure – which are likely to lead to superficial relationships, unresolved conflicts and a higher likelihood of relationship dissolution (Mikulincer and Shaver, 2003). In sum, insecure individuals are more likely to experience dissatisfying social interactions (Klein et al., 2020) and diminished perceived social support which is in turn associated with higher experiences of distress (Vogel and Wei, 2005) and with higher symptom severity in patients with mental disorders (Cloitre et al., 2008; Hankin et al., 2005). Previous research also indicates that not only the objective social support of insecurely attached individuals is diminished but that these individuals' subjective perception of social support is also negatively biased (Collins and Feeney, 2004). Further studies differentiating between objective measures of social support and perceived social support are therefore needed. Moreover, the causal direction of
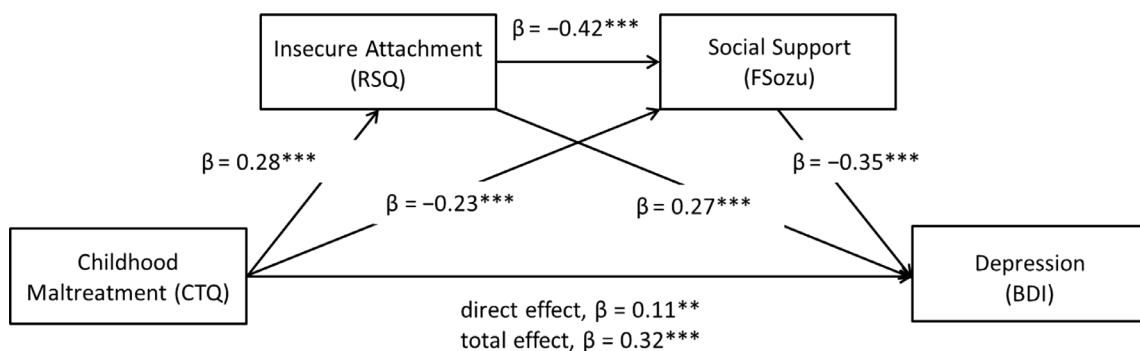

Fig. 4. Model of childhood maltreatment as a predictor of depression severity sequentially mediated by insecure attachment and perceived social support. Standardized coefficients are reported for each path. RSQ = Relationship Scales Questionnaire; CTQ = Childhood Trauma Questionnaire; BDI = Beck Depression Inventory. ***p < .001, **p < .01. N = 577.

the association between perceived social support and depression severity in our model is ambiguous. A bidirectional causality is supported by Coyne's interactional model (Coyne, 1976). He states that the interpersonal behavior of depressed people generally elicits rejection from others and that these experiences of rejection, in turn, increase depressive severity (Coyne, 1976). More longitudinal studies examining the causal directions are therefore needed.

4.4. Strengths and limitations

An important limitation of this study is the cross-sectional design. Although the hypothesized temporal sequence of exposure to CM, attachment and clinical outcome is theoretically plausible, a reverse order cannot be excluded: e.g. self-reports of attachment style can be also influenced by depression severity. Therefore, caution is advised when drawing conclusions about causality and more longitudinal studies are needed. Moreover, this study does not consider some characteristics of CM exposure – besides CM type – which might also influence outcomes or buffer negative effects of CM, e.g.: timing of exposure to CM, presence of other responsive primary attachment figures, and closeness in the family network of abusive caregivers (e.g. parent vs. teacher). Yet, the current study adds to previous work examining the mediational role of attachment for the effect of CM exposure on depression. We replicated the mediation in a large clinical sample with high variability in depression severity and in CM exposure. The lifetime depression diagnoses were verified with structured clinical diagnostic interviews. The large sample size allowed us to examine the specific effects of individual CM types and the sequential mediation model.

4.5. Practical implications

Previous research indicates that attachment insecurity may result in lower response to psychotherapy, which might be mediated by weaker therapeutic alliances (Diener and Monroe, 2011; Reiner et al., 2016). However, Bowlby stresses the changeability of internal working models, for instance through psychotherapy (Bowlby, 1988) which is supported by a meta-analysis, reporting significant increases in attachment security following psychotherapy (Taylor et al., 2015). Improving attachment security is an important goal of psychotherapy which psychotherapist might approach by providing a feeling of security and becoming a "secure base" for the patient. This focus on a secure therapeutic relationship might be particularly important for patients with insecure attachment styles and histories of emotional abuse or neglect. Some therapeutic approaches for chronic mental disorders – as Schema Therapy (Young et al., 2003), the Cognitive Behavioral Analysis System of Psychotherapy (CBASP) (McCullough, 2003), or Compassion Focused Therapy (CFT) (Gilbert, 2012) – explicitly focus on building a secure attachment by taking a distinctive therapeutic role. For instance, in Schema Therapy this role is referred to as "limited reparenting" and in CBASP as "disciplined personal involvement", including e.g. self-disclosure, warmth and nurturance but also empathic confrontation and limit setting. In general, psychotherapy training programs, supervision, and treatment manuals could be strengthened by focusing also on contextual factors (Flückiger et al., 2012), including the therapeutic role.

Contributors

A.K., U.D., I.N., and T.K. designed work package 1 of the FOR 2107 project, in which this study is part of. N.S., A.K., and E.-L.B. formulated the research questions of this article. A.K., D.Y., F.S., S.S., T.M., K.B., U.D., I.N., S.M., N.O., H.L., L.W., and T.K. contributed to data collection. N.S. analyzed and interpreted data and wrote the first manuscript in collaboration with M.F. and E.-L.B.. A.K., D.Y., F.S., S.S., T.M., K.B., U.D., I.N., S.M., N.O., H.L., L.W., and T.K. critically revised the article. All authors have approved the submitted work.

References

Acosta, H., Jansen, A., Nuscheler, B., Kircher, T., 2018. A voxel-based morphometry study on adult attachment style and affective loss. Neuroscience 392, 219–229. https://doi.

org/10.1016/j.neuroscience.2018.06.045.

Ainsworth, M.D.S., 1984. Attachment (Ed.) In: Endler, NS, McV. Hunt, J. (Eds.), Personality and the Behavioral Disorders. Wiley, New York, pp. 559–602.

Ainsworth, M.D.S., Blehar, M.C., Waters, E., Wall, S.N., 2015. Patterns of Attachment. Erlbaum, Hillsdale, NJ.

Arbuckle, J.L., 2017. Amos 25 User's Guide, Amos 25 User's Guide. IMBM SPSS, Chicago. https://doi.org/10.4135/9781446249345.

Bernstein, D.P., Fink, L., 1998. Childhood trauma questionnaire: A retrospective self-report. The Psychological Cooperation, San Antonio, Texas.

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 Abus. Negl. 27, 169–190. https://doi.org/10.1016/S0145-2134(02)00541-0.

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. Soc. Psychiatry Psychiatr. Epidemiol. 41, 796–805. https://doi.org/10.1007/s00127-006-0101-z.

Bowlby, J., 1988. A Secure Base: Parent-Child Attachment and Healthy Human Development. The Journal of Nervous and Mental Disease. https://doi.org/10.1097/00005053-199001000-00017. Basic Books, New York.

Butchart, A., Harvey, A.P., Mian, M., Fürniss, T., Kahane, T., World Health Organization, 2006. Preventing child maltreatment: A guide to taking action and generating evidence. World Heal. Organhttps://doi.org/10.1016/j.coms.2012.04.002.

Cloitre, M., Stovall-McClough, C., Zorbas, P., Charuvastra, A., 2008. Attachment Organization, Emotion Regulation, and Expectations of Support in a Clinical Sample of Women With Childhood Abuse Histories. J. Trauma. Stress 21, 282–289. https://doi.org/10.1002/jts.

Collins, N.L., Feeney, B.C., 2004. Working models of attachment shape perceptions of social support: Evidence from experimental and observational studies. J. Pers. Soc. Psychol. 87, 363–383. https://doi.org/10.1037/0022-3514.87.3.363.

Coyne, J.C., 1976. Depression and the response of others. J. Abnorm. Psychol. 85, 186–193. https://doi.org/10.1037/0021-843X.85.2.186.

Dagan, O., Facompré, C.R., Bernard, K., 2018. Adult attachment representations and depressive symptoms: A meta-analysis. J. Affect. Disord. 236, 274–290. https://doi.org/10.1016/j.jad.2018.04.091.

Diener, M.J., Monroe, J.M., 2011. The relationship between adult attachment style and therapeutic alliance in individual psychotherapy: A meta-analytic review. Psychotherapy 48, 237–248. https://doi.org/10.1037/a0022425.

Dion, J., Gervais, J., Bigras, N., Blackburn, M.-E., Godbout, N., 2019. A Longitudinal Study of the Mediating Role of Romantic Attachment in the Relation Between Child Maltreatment and Psychological Adaptation in Emerging Adults. J. Youth Adolesc. https://doi.org/10.1007/s10964-019-01073-4.

Donges, U.S., Kugel, H., Stuhrmann, A., Grotegerd, D., Redlich, R., Lichev, V., Rosenberg, N., Ihme, K., Suslow, T., Dannlowski, U., 2012. Adult attachment anxiety is associated with enhanced automatic neural response to positive facial expression. Neuroscience 220, 149–157. https://doi.org/10.1016/j.neuroscience.2012.06.036.

Eberhart, N.K., Hammen, C.L., 2006. Interpersonal predictors of onset of depression during the transition to adulthood. Pers. Relatsh. 13, 195–206. https://doi.org/10.1111/j.1475-6811.2006.00113.x.

Flückiger, C., Del Re, A.C., Wampold, B.E., Symonds, D., Horvath, A.O., 2012. How central is the alliance in psychotherapy? A multilevel longitudinal meta-nalysis. J. Couns. Psychol 59, 10–17. https://doi.org/10.1037/a0025749.

Fowler, J.C., Allen, J.G., Oldham, J.M., Frueh, B.C., 2013. Exposure to interpersonal trauma, attachment insecurity, and depression severity. J. Affect. Disord. 149, 313–318. https://doi.org/10.1016/j.jad.2013.01.045.

Fydrich, T., Sommer, G., Brähler, E., 2007. F-SOZU: Fragebogen zur sozialen Unterstützung. Hogrefe, Göttingen.

Gilbert, P., 2012. Compassion-focused therapy. Cogn. Behav. Ther. 15, 140–165. https://doi.org/10.4135/9781446288368.n7.

Griffin, D., Bartholomew, K., 1994. Models of the Self and Other : Fundamental Dimensions Underlying Measures of Adult Attachment. J. Pers. Soc. Psychol. 67, 430–445. https://doi.org/10.1037/0022-3514.67.3.430.

Hankin, B.L., 2005. Childhood maltreatment and psychopathology: Prospective tests of attachment, cognitive vulnerability, and stress as mediating processes. Cognit. Ther. Res. 29, 645–671. https://doi.org/10.1007/s10608-005-9631-z.

Hankin, B.L., Kassel, J.D., Abela, J.R.Z., 2005. Adult attachment dimensions and specificity of emotional distress symptoms: Prospective investigations of cognitive risk and interpersonal stress generation as mediating mechanisms. Personal. Soc. Psychol. Bull. 31, 136–151. https://doi.org/10.1177/0146167204271324.

Hautzinger, M., Bailer, M., Worall, H., Keller, F., 1995. BDI: Beck-Depressions-Inventar, Testhandbuch, 2. überarbeitete Auflage. Bern Verlag Hans Huber.

Hayes, A.F., 2017. Introduction to mediation, moderation, and conditional process analysis: A regression-based approach.

Infurna, M.R., Reichl, C., Parzer, P., Schimmenti, A., Bifulco, A., Kaess, M., 2016. Associations between depression and specific childhood experiences of abuse and neglect: A meta-analysis. J. Affect. Disord. 190, 47–55. https://doi.org/10.1016/j.jad.2015.09.006.

Kircher, T., Wöhr, M., Nenadic, I., Schwarting, R., Schratt, G., Alferink, J., Culmsee, C., Garn, H., Hahn, T., Müller-Myhsok, B., Dempfle, A., Hahmann, M., Jansen, A., Pfefferle, P., Renz, H., Rietschel, M., Witt, S.H., Nöthen, M., Krug, A., Dannlowski, U., 2018. Neurobiology of the major psychoses: a translational perspective on brain structure and function—the FOR2107 consortium. Eur. Arch. Psychiatry Clin. Neurosci. 1–14. https://doi.org/10.1007/s00406-018-0943-x.

Klein, J.P., Stahl, J., Hüppe, M., McCullough, J.P., Schramm, E., Ortel, D., Sondermann, S., Schröder, J., Moritz, S., Schweiger, U., 2020. Do interpersonal fears mediate the association between childhood maltreatment and interpersonal skills deficits? A matched cross-sectional analysis. Psychother. Res 30, 267–278. https://doi.org/10.

1080/10503307.2018.1532125.

Kurdek, L.A., 2002. On being insecure about the assessment of attachment styles. J. Soc. Pers. Relat. 19, 811–834.

Lowell, A., Renk, K., Adgate, A.H., 2014. The role of attachment in the relationship between child maltreatment and later emotional and behavioral functioning. Child Abus. Negl. 38, 1436–1449. https://doi.org/10.1016/j.chiabu.2014.02.006.

Mallinckrodt, B., Wei, M., 2005. Attachment, social competencies, social support, and psychological distress. J. Couns. Psychol. 52, 358–367. https://doi.org/10.1037/0022-0167.52.3.358.

Mandelli, L., Petrelli, C., Serretti, A., 2015. The role of specific early trauma in adult depression: A meta-analysis of published literature. Childhood trauma and adult depression. Eur. Psychiatry 30, 665–680. https://doi.org/10.1016/j.eurpsy.2015.04.007.

McCullough, J.P., 2003. Treatment for chronic depression: Cognitive Behavioral Analysis System of Psychotherapy (CBASP). J. Psychother. Integr. 13, 241–263. https://doi.org/10.1037/1053-0479.13.3/4.241.

Mikulincer, M., Shaver, P.R., 2012. An attachment perspective on psychopathology. World Psychiatry 11–15. https://doi.org/10.1037/14498-005.

Mikulincer, M., Shaver, P.R., 2007. Attachment in Adulthood: Structure, Dynamics, and Change. Guilford Press.

Mikulincer, M., Shaver, P.R., 2003. The Attachment Behavioral System In Adulthood: Activation, Psychodynamics, And Interpersonal Processes. Adv. Exp. Soc. Psychol. 35, 53–152. https://doi.org/10.1016/S0065-2601(03)01002-5.

Muller, R.T., Gragtmans, K., Baker, R., 2008. Childhood physical abuse, attachment, and adult social support: Test of a mediational model. Can. J. Behav. Sci. 40, 80–89. https://doi.org/10.1037/0008-400X.40.2.80.

Muller, R.T., Thornback, K., Bedi, R., 2012. Attachment as a Mediator between Childhood Maltreatment and Adult Symptomatology. J. Fam. Violence 27, 243–255. https://doi.org/10.1007/s10896-012-9417-5.

Nelson, J., Klumparendt, A., Doebler, P., Ehring, T., 2017. Childhood maltreatment and characteristics of adult depression: meta-analysis. Br. J. Psychiatry 210, 96–104. https://doi.org/10.1192/bjp.bp.115.180752.

R Core Team, 2019. R: A language and environment for statistical computing.

Reiner, I., Bakermans-Kranenburg, M.J., Van Ijzendoorn, M.H., Fremmer-Bombik, E., Beutel, M., 2016. Adult attachment representation moderates psychotherapy treatment efficacy in clinically depressed inpatients. J. Affect. Disord. 195, 163–171. https://doi.org/10.1016/j.jad.2016.02.024.

Riggs, S.A., 2010. Childhood emotional abuse and the attachment system across the life cycle: What theory and research tell us. J. Aggress. Maltreatment Trauma 19, 5–51. https://doi.org/10.1080/10926770903475968.

Roisman, G.I., Holland, A., Fortuna, K., Fraley, R.C., Clausell, E., Clarke, A., 2007. The Adult Attachment Interview and Self-Reports of Attachment Style: An Empirical Rapprochement. J. Pers. Soc. Psychol. 92, 678–697. https://doi.org/10.1037/0022-3514.92.4.678.

Rosseel, Y., 2012. lavaan: An R package for structural equation modeling. J. Stat. Softw. 48, 1–36.

Schierholz, A., Krüger, A., Barenbrügge, J., Ehring, T., 2016. What mediates the link between childhood maltreatment and depression? The role of emotion dysregulation, attachment, and attributional style. Eur. J. Psychotraumatol 7, 1–11. https://doi.org/10.3402/ejpt.v7.32652.

Steffanowski, A., Oppl, M., Meyerberg, J., Schmidt, J., Wittmann, W., Nübling, R., 2001. Empirische Ergebnisse Psychometrische Überprüfung einer deutschsprachigen Version (Ed.) In: Bassler, M. (Ed.), Störungsspezifische Therapieansätze - Konzepte Und Ergebnisse. Psychosozialer VerlagGießen, pp. 320–342.

Stratharn, L., 2011. Maternal neglect: Oxytocin, dopamine and the neurobiology of attachment. J. Neuroendocrinol. 23, 1054–1065. https://doi.org/10.1111/j.1365-2826.2011.02228.x.

Suslow, T., Kugel, H., Rauch, A.V., Dannlowski, U., Bauer, J., Konrad, C., Arolt, V., Heindel, W., Ohrmann, P., 2009. Attachment avoidance modulates neural response to masked facial emotion. Hum. Brain Mapp. 30, 3553–3562. https://doi.org/10.1002/hbm.20778.

Taylor, P., Rietzschel, J., Danquah, A., Berry, K., 2015. Changes in attachment representations during psychological therapy. Psychother. Res. 25, 222–238. https://doi.org/10.1080/10503307.2014.886791.

Verhage, M.L., Schuengel, C., Madigan, S., Pasco Fearon, R.M., Oosterman, M., Cassibba, R., Bakermans-Kranenburg, M.J., Van Ijzendoorn, M.H, 2016. Narrowing the transmission gap: A synthesis of three decades of research on intergenerational transmission of attachment. Psychol. Bull. 142, 337–366. https://doi.org/10.1037/bul0000038.

Vogel, D.L., Wei, M., 2005. Adult attachment and help-seeking intent: The mediating roles of psychological distress and perceived social support. J. Couns. Psychol. 52, 347–357. https://doi.org/10.1037/0022-0167.52.3.347.

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 Abus. Negl 76, 533–545. https://doi.org/10.1016/j.chiabu.2017.05.002.

Wingenfeld, K., Spitzer, C., Mensebach, C., Grabe, H.J., Hill, A., Gast, U., Schlosser, N., Höpp, H., Beblo, T., Driessen, M., 2010. The German Version of the Childhood Trauma Questionnaire (CTQ): Preliminary Psychometric Properties. PPmP Psychother. Psychosom. Medizinische Psychol. 60, 442–450.

Wittchen, H.-U., Wunderlich, U., Gruschwitz, S., Zaudig, M., 1997. SKID I. Strukturiertes Klinisches Interview für DSM-IV. Achse I: Psychische Störungen. Interviewheft und Beurteilungsheft. Eine deutschsprachige, erweiterte Bearb. d. amerikanischen Originalversion des SKID I.

Young, J.E., Klosko, J.S., Weishaar, M.E., 2003. Schema therapy: A practitioner's guide. Guilford Press, New York, NY.