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# Childhood emotional trauma and emotional breakdown: the mediating roles of attachment styles and child schema modes

Haniyeh Davarzani, Behzad Rigi Kooteh, Azam Kargar

Department of Psychiatry, School of Medicine, Zahedan University of Medical Sciences, Iran

## Abstract

This study examined the mediating roles of attachment styles and child schema modes in the association between childhood emotional trauma and emotional breakdown following romantic relationship dissolution among 120 medical students. Participants completed validated measures assessing childhood emotional trauma, attachment styles, child schema modes, and post-breakup emotional distress. Results revealed that childhood emotional trauma significantly predicted emotional breakdown, both directly and indirectly *via* attachment styles and maladaptive child schema modes. Insecure attachment styles (anxious and avoidant) and maladaptive schema modes (vulnerable, angry, enraged, and impulsive child) were positively associated with increased emotional breakdown, while secure attachment and the happy child mode were protective. Mediation analyses confirmed that both attachment styles and child schema modes partially accounted for the relationship between childhood trauma and emotional breakdown. These findings underscore the importance of cognitive-emotional mechanisms, particularly schema modes, in the psychological response to romantic loss. Clinical interventions targeting maladaptive schema modes may enhance resilience and mitigate distress among young adults experiencing relational loss. Limitations and future research directions are discussed.

**Key words:** child abuse, attachment, emotions, schemas.

*Correspondence to: Azam Kargar, Department of Psychiatry, School of Medicine, Zahedan University of Medical Sciences, Zahedan, Iran.*
*E-mail: azamkargar09@gmail.com*

## Introduction

Romantic relationships are a fundamental aspect of young adults' lives, especially among university students, as they fulfill the basic human need for belongingness and connection.[1] According to Erikson's psychosocial development theory, early adulthood represents a critical period for establishing intimate relationships with peers and romantic partners.[2] During the ages of 18 to 25, many young adults engage in multiple romantic relationships in an effort to clarify their criteria for a lifelong partner, a developmental process often characterized by instability and frequent breakups.[3] Prospective studies indicate that over one-third (36.7%) of young adults experience a significant romantic relationship dissolution within a single year.[4,5] The termination of a romantic relationship is widely recognized as one of the most distressing life events, with well-documented negative consequences for mental health.[6] Even non-marital separations can evoke profound feelings of grief, anger, and insecurity,[7] and are commonly reported by university students as the most stressful event they have encountered, frequently accompanied by cognitive, emotional, and somatic disturbances.[2,8] While grief following relational loss is a natural reaction, the intensity and duration of such distress are clinically significant, often manifesting as anxiety, hopelessness, depression, sleep disturbances, and even suicidal ideation.[9]

The concept of "love trauma syndrome", first introduced by Ross, describes the severe and persistent symptoms that may follow a breakup, including marked declines in academic, social, and occupational functioning, as well as extensive psychosomatic complaints. In its initial stages, individuals may experience the traumatic loss as a psychological shock, largely resulting from the violation of anticipated relational security and the shattering of positive expectations regarding the relationship. Consequently, romantic separation is considered a highly stressful, potentially traumatic event.[10,11]

Childhood maltreatment, particularly emotional trauma, has been shown to increase the risk of adjustment problems during adolescence and adulthood, and may interfere with the ability to form and maintain healthy romantic relationships—a key developmental task in early adulthood.[12] While the long-term effects of childhood physical and sexual abuse have been extensively documented, less attention has been paid to the consequences of childhood emotional trauma.[13] Attachment orientation, as a potential consequence of early maltreatment, has been implicated in the modulation of distress intensity following romantic breakups.[14] Specifically, childhood maltreatment is associated with insecure attachment styles, greater relational difficulties, and higher levels of grief and maladjustment after relationship dissolution.[9] Adults with a history of early adversity often report diminished relational security and experience more severe grief following breakups, largely mediated by insecure attachment styles.[15] Despite the well-established impact of childhood maltreatment and insecure

attachment on post-breakup distress, few studies have investigated the underlying mechanisms that maintain these associations.

Recent research suggests that modifiable cognitive-emotional factors may mediate the relationship between childhood adversity, attachment styles, and the severity of post-breakup distress. In particular, cognitive factors have been posited to play a critical mediating role in the link between childhood trauma and adult psychopathology.[16] The schema therapy framework, which encompasses early maladaptive schemas (EMS) and schema modes (*i.e.*, schema-driven emotional-cognitive states), offers a promising theoretical basis for understanding these mechanisms.[17] Early adverse experiences are thought to lead to the formation of EMS, primarily resulting from unmet emotional needs and the interaction of trauma with temperament.[16,18] Schema therapy, as developed by Young, addresses these chronic psychological problems through the identification and modification of EMS, maladaptive coping styles, and schema modes.[19,20]

Schemas are enduring cognitive structures about the self and the world that, once activated by experiences reminiscent of childhood adversity, can trigger heightened emotional responses in adulthood. Schema modes, on the other hand, are temporary emotional, cognitive, and behavioral states that arise from the activation of schemas and are maintained through maladaptive coping responses; research has indicated that coping styles mediate the relationship between schemas and modes, while schema modes themselves are strong predictors of psychological symptoms. Young's model categorizes schema modes into four domains: child modes, maladaptive coping modes, dysfunctional parent modes, and the healthy adult mode.[19,20]

It has been proposed that EMS may be reactivated in adulthood by stressful events such as romantic breakups, thereby contributing to psychological difficulties, while schema modes may serve as key mediators in this process. However, to date, research on schema modes in trauma-exposed populations, particularly in the context of romantic relationship dissolution, remains scarce. This gap highlights the need for further investigation into the role of schema modes in the psychological response to romantic loss.

Given the high prevalence of romantic breakups among university students and their significant impact on mental health, the present study aims to examine the mediating role of specific child schema modes (*i.e.*, the vulnerable child, angry child, enraged child, undisciplined child, and impulsive child modes) in the relationship between childhood emotional trauma, attachment styles, and the severity of emotional breakdown following romantic relationship dissolution among medical students.

## Materials and Methods

This study utilized a descriptive-correlational design with a stepwise regression analysis to investigate the mediating role of child schema modes in the relationship between childhood emotional trauma, attachment styles, and emotional breakdown in young adults. As data were collected at a single time point, the research design was cross-sectional.

### Participants and procedure

The minimum sample size was determined using Green's formula (N≥104+K), where N is the sample size, and K is the number of predictor variables, resulting in a minimum of 107 participants. Accounting for potential incomplete or invalid responses and possible attrition, a total of 120 participants were recruited using purposive sampling. Eligible participants were students from the Zahedan University of Medical Sciences, aged between 18 and 28 years, who had experienced a romantic or close interpersonal relationship (including deep friendship, engagement, or marriage) that had ended at least 1 month and at most 1 year prior to the study. The relationship had to involve emotional commitment, intimacy, and interdependence. Ethical approval was obtained from the university's ethics committee (code: IR.ZAUMS.REC.1404.081). All participants provided informed consent, were assured of confidentiality, and were free to withdraw from the study at any stage.

### Measures

#### *Romantic Breakup Grief Inventory*

Emotional breakdown following romantic separation was assessed using the Romantic Breakup Grief Inventory (RBGI) questionnaire (based on the Love Trauma Syndrome Inventory), which comprises 45 items rated on a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree), yielding scores from 45 to 225. Higher scores indicate greater severity of post-separation grief symptoms. The RBGI has demonstrated excellent internal consistency (Cronbach's α=0.95) and test-retest reliability (r=0.83) in Iranian samples.[21] In the present sample, Cronbach's α was 0.96.

#### *Childhood Trauma Questionnaire-Short Form*

The Childhood Trauma Questionnaire-Short Form (CTQ-SF) is a 28-item self-report inventory measuring five types of childhood maltreatment (emotional, physical, and sexual abuse, as well as emotional and physical neglect) on a 5-point Likert scale (1 = never true to 5 = very often true).[22] It includes 25 items measuring the core components and 3 validity items. The CTQ-SF has shown high reliability (subscale α ranging from 0.78 to 0.95) and concurrent validity (0.59-0.78) in international and Iranian studies.[22,23] In the current study, Cronbach's α was 0.88.

#### *Revised Adult Attachment Scale*

Adult attachment styles were measured using the 18-item Revised Adult Attachment Scale (RAAS), which assesses three subscales: closeness, dependency, and anxiety, corresponding to secure, anxious, and avoidant attachment styles. Items are rated on a 5-point Likert scale (1 = not at all characteristic to 5 = very characteristic).[24] The reliability of the RAAS in the Iranian sample was good (r=0.89), and its convergent validity with the State Adult Attachment Scale was 0.92.[9] In the present study, the RAAS showed good internal reliability in the subscales of intimacy (a=0.86), dependence (a=0.76), and anxiety (a=0.82).

#### *Schema Mode Inventory*

Schema modes were assessed with the Schema Mode Inventory (SMI), a 124-item measure developed by Young *et al*.,[19] evaluating 14 schema modes across four domains: maladaptive child, dysfunctional parent (critic), maladaptive coping, and healthy adult. Items are rated on a 6-point Likert scale (1 = never to 6 = always), with higher scores indicating greater dominance of that schema mode. The SMI has shown excellent internal consistency (Cronbach's α=0.79-0.96) and convergent validity (correlations >0.60 with mood and personality inventories).[25] In this study, child schema modes were examined. The reliability of this questionnaire in the present study, calculated with Cronbach's α, was 0.92.

## Data collection and ethics

After securing ethical approval and informed consent, eligible students were briefed on the study's objectives and procedures and assured that their responses would be analyzed collectively and kept confidential. Data collection was conducted *via* paper-and-pencil questionnaires administered in a quiet setting. Participation was voluntary, and participants could withdraw at any point without penalty.

## Statistical analysis

Initially, the normality of data distribution was assessed using the Kolmogorov-Smirnov test. Pearson correlation coefficients were calculated to examine the associations between variables. Hierarchical regression analyses were used to investigate the relationships among childhood emotional trauma, attachment styles, child schema modes, and emotional breakdown, as well as the mediating roles of attachment styles and child schema modes. Furthermore, Hayes' PROCESS macro (version 4.2) was employed to test the mediation model. The mediating role was considered present if the indirect effect was significant and the confidence interval (CI) excluded 0. As per the recommendation of Preacher and Hayes,[26] the bootstrap method (with 5000 bootstrap samples and 95% bias-corrected CI) was applied to estimate direct, indirect, and total effects. All statistical analyses were conducted using SPSS version 30 (IBM, Armonk, NY, USA), and a p-value of less than 0.05 was considered statistically significant.

**Table 1.** Demographic characteristics of participants.

| Variables | | |
|---|---|---|
| Age, mean ± standard deviation | | 22.19±2.41 |
| Gender, n (%) | Male | 55 (45.8) |
| | Female | 65 (54.2) |
| Marital status | Single | 118 (98.3) |
| | Married | 2 (1.7) |
| Education level, n (%) | Bachelor | 13 (10.8) |
| | Master | 5 (4.2) |
| | Doctorate | 102 (85.0) |
| Speciality, n (%) | Clinical psychology | 3 (2.5) |
| | Immunology | 1 (0.8) |
| | Nutritional science | 14 (11.7) |
| | Medicine | 102 (85) |
| Average relationship duration, n (%) | 1-3 month | 27 (22.5) |
| | 3-6 months | 46 (38.3) |
| | > 6 months | 47 (39.2) |
| Relationship type | Close friend | 110 (91.7) |
| | Engaged | 8 (6.6) |
| | Married | 2 (1.7) |

# Results

## Participant characteristics

A total of 120 medical students (54.2% female; mean age = 22.19, standard deviation = 2.41) participated in the study (Table 1). The majority were single (98.3%) and pursuing a doctorate (85.0%) in medicine (85.0%). Most participants reported that their most recent relationship was a close friendship (91.7%), with durations ranging across 1-3 months (22.5%), 3-6 months (38.3%), and more than 6 months (39.2%).

## Correlational analyses

Bivariate correlations among the key study variables are presented in Table 2. Emotional breakdown scores were significantly and positively correlated with childhood emotional trauma ($r=0.60$, $p<0.001$), anxious attachment ($r=0.64$, $p<0.001$), avoidant attachment ($r=0.70$, $p<0.001$), and maladaptive child schema modes including vulnerable child ($r=0.60$, $p<0.001$), angry child ($r=0.56$, $p<0.001$), enraged child ($r=0.40$, $p<0.001$), impulsive child ($r=0.33$, $p<0.001$), and undisciplined child ($r=0.38$, $p<0.001$). In contrast, secure attachment ($r=-0.58$, $p<0.001$) and the happy child mode ($r=-0.47$, $p<0.001$) were negatively correlated with emotional breakdown.

**Table 2.** Correlations between attachment styles, child schema modes, childhood emotional trauma, and emotional breakdown.

| Variables | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Secure attachment style | - | | | | | | | | | | |
| 2. Anxious attachment style | -0.57*** | - | | | | | | | | | |
| 3. Avoidant attachment style | -0.59*** | 0.96*** | - | | | | | | | | |
| 4. Vulnerable child | -0.54*** | 0.50*** | 0.50*** | - | | | | | | | |
| 5. Angry child | -0.50*** | 0.36*** | 0.38*** | 0.81*** | - | | | | | | |
| 6. Enraged child | -0.42*** | 0.32*** | 0.30*** | 0.72*** | 0.80*** | - | | | | | |
| 7. Impulsive child | -0.28** | 0.26** | 0.29** | 0.63*** | 0.63*** | 0.59*** | - | | | | |
| 8. Undisciplined child | -0.35*** | 0.25** | 0.26** | 0.65*** | 0.77*** | 0.73*** | 0.68*** | - | | | |
| 9. Happy child | 0.26** | -0.38*** | -0.40*** | -0.52*** | -0.55*** | -0.54*** | 0.61*** | -0.55*** | - | | |
| 10. Childhood emotional trauma | -0.53*** | 0.56*** | 0.57*** | 0.62*** | 0.54*** | 0.52*** | 0.51*** | 0.48*** | -0.55*** | - | |
| 11. Emotional breakdown | -0.58*** | 0.64*** | 0.70*** | 0.60*** | 0.56*** | 0.40*** | 0.33*** | 0.38*** | -0.47*** | 0.60*** | - |

**p<0.01; ***p<0.001.

## Predictive role of childhood emotional trauma and attachment styles

Hierarchical regression analysis (Table 3) indicated that childhood emotional trauma alone significantly predicted emotional breakdown following relationship dissolution (β=0.601, p<0.001), accounting for 36.1% of the variance ($R^2$=0.361, p<0.001). When attachment styles were added to the model, the explained variance increased to 58.4% ($\Delta R^2$=0.223, p<0.001). Specifically, avoidant (β=0.954, p<0.001) and anxious attachment (β=0.522, p=0.035) styles were strong positive predictors of emotional breakdown, while secure attachment demonstrated a protective effect (β=-0.179, p=0.024). The influence of childhood emotional trauma remained significant in the final model (β=0.253, p=0.001).

## Predictive role of childhood emotional trauma and child schema modes

To assess the mediating effect of child schema modes, a hierarchical regression was conducted, entering childhood emotional trauma in the first step and child schema modes in the second (Table 4). The inclusion of child schema modes increased the explained variance in emotional breakdown symptoms from 36.1% to 52.6% ($\Delta R^2$=0.164, p<0.001). Among the child schema modes, vulnerable child (β=0.359, p=0.005), angry child (β=0.386, p=0.008), enraged child (β=0.259, p=0.031), and impulsive child (β=0.224, p=0.028) emerged as significant positive predictors of emotional breakdown. Conversely, the happy child mode was inversely associated with emotional breakdown (β=-0.202, p=0.027). The undisciplined child mode did not significantly predict emotional breakdown in the presence of other schema modes (β=0.092, p=0.433). Childhood emotional trauma remained a significant predictor (β=0.352, p<0.001) after accounting for child schema modes.

## Mediation analysis

The results indicated that childhood emotional trauma had a significant direct effect on emotional breakdown (b=1.667, p=0.001), with a total effect of b=2.296 (95% CI: 1.481, 3.177). Analysis of the mediating role of attachment styles revealed that childhood emotional trauma was negatively associated with secure attachment style (b=-0.346, p<0.001) and positively associated with both anxious (b=0.427, p<0.001) and avoidant attachment styles (b=0.443, p<0.001). Secure attachment style was negatively related to emotional breakdown (b=-1.813, p=0.023), while anxious (b=4.565, p=0.034) and avoidant attachment styles (b=8.175, p<0.001) were positively related. The indirect effects *via* secure (b=-0.627, 95% CI: -1.380, -0.013) and avoidant (b=3.622, 95%

**Table 3.** Hierarchical regression analysis predicting emotional breakdown based on childhood emotional trauma and attachment styles.

| Variables | Model 1 | | | | Model 2 | | | |
|---|---|---|---|---|---|---|---|---|
| | B (β) | SE | t | p | B (β) | SE | t | p |
| Childhood emotional trauma | 3.963 (0.601) | 0.485 | 8.167 | <0.001 | 1.667 (0.253) | 0.507 | 3.290 | 0.001 |
| Secure attachment style | | | | | -1.813 (-0.179) | 0.792 | -2.290 | 0.024 |
| Anxious attachment style | | | | | 4.565 (0.522) | 2.134 | 2.139 | 0.035 |
| Avoidant attachment style | | | | | 8.176 (0.954) | 2.131 | 3.837 | <0.001 |
| $R^2$ | 0.361 | | | | 0.584 | | | |
| Adj. $R^2$ | 0.356 | | | | 0.570 | | | |
| $\Delta R^2$ | 0.361 | | | | 0.223 | | | |
| F (df1, df2) | 66.704 (1, 118) | | | <0.001 | 40.434 (4, 115) | | | <0.001 |
| ΔF (df1, df2) | 66.704 (1, 118) | | | <0.001 | 20.599 (3, 115) | | | <0.001 |

B, unstandardized coefficients; β, standardized coefficients; SE, standard error; t, t-value; p, p-value; R2, R square; Adj. $R^2$, adjusted R square; $\Delta R^2$, R square change; ΔF, F change; df, degrees of freedom.

**Table 4.** Hierarchical regression analysis predicting emotional breakdown from childhood emotional trauma and child schema modes.

| Variables | Model 1 | | | | Model 2 | | | |
|---|---|---|---|---|---|---|---|---|
| | B (β) | SE | t | p | B (β) | SE | t | p |
| Childhood emotional trauma | 3.963 (0.601) | 0.485 | 8.167 | <0.001 | 2.320 (0.352) | 0.587 | 3.952 | <0.001 |
| Vulnerable child | | | | | 1.590 (0.359) | 0.550 | 2.889 | 0.005 |
| Angry child | | | | | 1.589 (0.386) | 0.591 | 2.686 | 0.008 |
| Enraged child | | | | | 1.197 (0.259) | 0.547 | 2.190 | 0.031 |
| Impulsive child | | | | | 1.461 (0.224) | 0.658 | 2.221 | 0.028 |
| Undisciplined child | | | | | 0.488 (0.092) | 0.619 | 0.788 | 0.433 |
| Happy child | | | | | -1.189 (-0.202) | 0.532 | -2.234 | 0.027 |
| $R^2$ | 0.361 | | | | 0.526 | | | |
| Adj. $R^2$ | 0.356 | | | | 0.496 | | | |
| $\Delta R^2$ | 0.361 | | | | 0.164 | | | |
| F (df1, df2) | 66.704 (1, 118) | | | <0.001 | 17.728 (7, 112) | | | <0.001 |
| ΔF (df1, df2) | 66.704 (1, 118) | | | <0.001 | 6.472 (6, 112) | | | <0.001 |

B, unstandardized coefficients; β, standardized coefficients; SE, standard error; t, t-value; p, p-value; $R^2$, R square; Adj. $R^2$, adjusted R square; ΔR2, R square change; ΔF, F change; df, degrees of freedom.

CI: 1.968, 5.436) attachment styles were significant, whereas the indirect effect *via* anxious attachment style was also significant (b=1.953, 95% CI: 0.466, 3.710) (Figure 1). These findings suggest that attachment styles partially mediate the relationship between childhood emotional trauma and emotional breakdown.

The results indicated that childhood emotional trauma had a significant direct effect on emotional breakdown (b=2.320, p<0.001), with a total effect of b=1.643 (95% CI: 0.645, 2.811). Additionally, several schema modes mediated this relationship. Specifically, the vulnerable child (b=1.589, p=0.004; indirect effect b=1.471), angry child (b=1.588, p=0.008; indirect effect b=1.384), enraged child (b=1.196, p=0.030; indirect effect b=0.901), and impulsive child (b=1.461, p=0.028; indirect effect b=0.762) modes were positively and significantly associated with emotional breakdown. In contrast, the happy child mode showed a significant negative relationship (b=-1.189, p=0.027; indirect effect b=-0.745) (Figure 2). These findings suggest that maladaptive child schema modes significantly mediate the impact of childhood emotional trauma on emotional

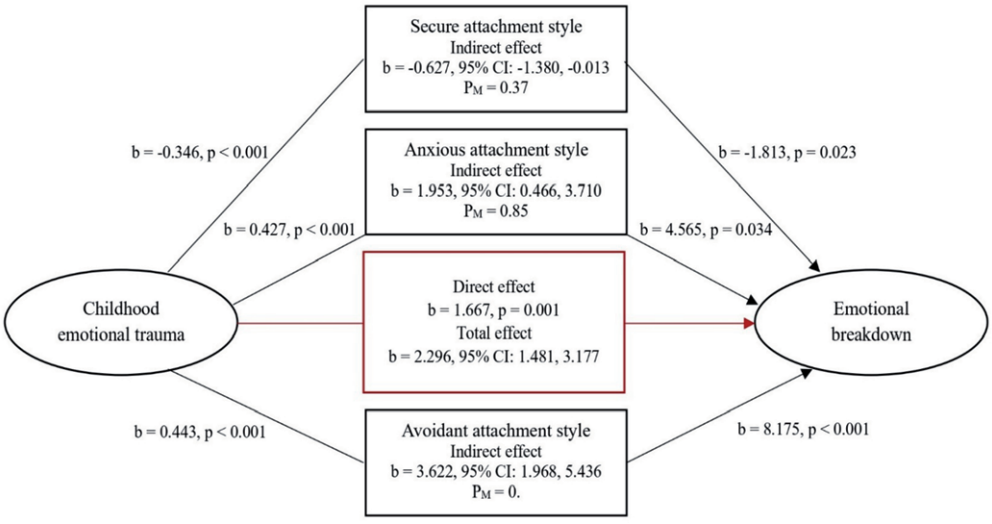


**Figure 1.** The mediating role of attachment styles in the relationship between childhood emotional trauma and emotional breakdown. b, coefficients; CI, confidence interval; p, p-value, $P_M$, effect size (ratio of indirect to total effect).

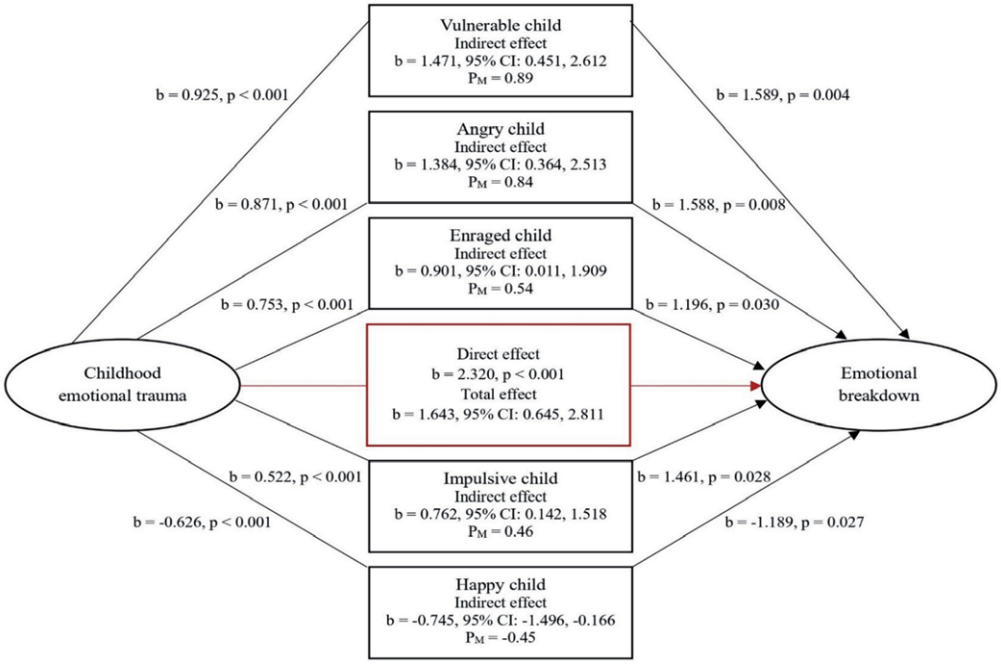


**Figure 2.** The mediating roles of child schema modes in the relationship between childhood emotional trauma and emotional breakdown. b, coefficients; CI, confidence interval; p, p-value, $P_M$, effect size (ratio of indirect to total effect).

breakdown, emphasizing the central role of child schema modes in this process.

## Discussion

The present study offers significant insight into the psychological processes underlying emotional breakdown following romantic relationship dissolution among university students. Specifically, our findings corroborate the hypothesis that childhood emotional trauma and insecure attachment styles are each independently associated with heightened vulnerability to emotional breakdown in the context of relational loss. Notably, child schema modes emerged as salient mediators, elucidating the cognitive-emotional mechanisms through which early adversity and attachment patterns translate into adult emotional distress.

The robust association between childhood emotional trauma and emotional breakdown aligns with a well-established body of research documenting the long-term effects of early maltreatment on affective functioning in adulthood.[13,25,27-30] From a developmental psychopathology perspective, early emotional trauma is posited to disrupt normative emotion regulation capacities and foster latent vulnerabilities that may remain dormant until activated by salient stressors, such as the dissolution of significant romantic relationships.[9,31] Neurobiological findings further support this model, with evidence of structural and functional alterations in brain regions implicated in stress reactivity and emotion regulation, such as the hippocampus, among individuals exposed to early adversity.[27] Consequently, the emotional intensity and persistence of post-breakup distress in this population appear to be rooted in both psychological and neurobiological sequelae of childhood trauma.

Our results further substantiate the critical role of attachment styles in moderating the response to relational loss. Consistent with attachment theory and prior empirical evidence, secure attachment was negatively associated with emotional breakdown, whereas anxious and avoidant attachment styles predicted greater distress.[32-34] Secure attachment, characterized by positive internal working models and adaptive emotion regulation strategies, appears to buffer individuals against the more severe affective consequences of romantic separations. In contrast, anxious attachment is typically marked by heightened sensitivity to rejection, negative self-appraisals, and ruminative coping, all of which amplify emotional breakdown.[33,34] The avoidant style, often associated with emotional suppression and cognitive distancing, may provide short-term protection but is linked to maladaptive outcomes over time.[5,33] These findings underscore the enduring influence of early relational experiences on later coping with loss.

A major contribution of the current study lies in its application of the schema therapy framework to this context. The mediating role of schema modes, particularly maladaptive child modes such as the vulnerable child, angry child, enraged child, and impulsive child, highlights the centrality of schema-driven states in the escalation of emotional breakdown. According to schema theory, early adverse experiences contribute to the development of maladaptive schemas, which, when activated in adulthood by stressors reminiscent of childhood trauma, give rise to intense emotional states and dysfunctional coping responses.[19,20,30,35] The present findings suggest that these schema modes not only mediate but may also amplify the relationship between early trauma and adult distress, as evidenced by the increase in explained variance when schema modes are included in the prediction models. Conversely, the happy child mode, reflective of positive early relational experiences and adaptive self-soothing capacities, was inversely associated with emotional breakdown. This is consistent with literature indicating that the presence of healthy schema modes (*e.g.*, happy child, healthy adult) promotes resilience and buffers against the adverse effects of early trauma.[36-41] Collectively, these results provide empirical support for the schema mode model as a valuable framework for understanding the psychological aftermath of relational loss, and suggest that interventions targeting maladaptive schema modes may be particularly effective in ameliorating emotional breakdown.

### Practical implications

The clinical and practical implications of these findings are considerable. First, a comprehensive assessment of childhood emotional trauma and attachment styles should be standard practice in clinical settings where individuals present with significant distress following relationship loss. The integration of schema mode assessment, as employed in schema therapy, can further refine case conceptualization and intervention planning. Interventions specifically targeting maladaptive schema modes, such as mode-specific cognitive restructuring, experiential techniques, and the cultivation of healthy adult and happy child modes, may hold promise for reducing emotional breakdown and enhancing psychological resilience. University counseling centers and mental health practitioners working with young adults should consider implementing integrative approaches that address both attachment-related vulnerabilities and schema-based dysfunctions. Preventative measures are also warranted. Early interventions aimed at fostering secure attachment relationships and supporting the development of adaptive schema modes during childhood and adolescence may confer long-term protective effects, reducing susceptibility to emotional breakdown in response to future relational stressors.

### Limitations and future directions

Notwithstanding its contributions, the present study is subject to several limitations. Its cross-sectional design precludes causal inference, necessitating longitudinal research to establish temporal precedence and directionality among the variables of interest. The exclusive reliance on self-report measures introduces the potential for recall and social desirability biases, while the homogeneity of the sample (medical students from a single institution) limits the generalizability of the findings. Future research should seek to replicate these results in more diverse and representative populations, utilizing multi-method assessment strategies (*e.g.*, clinical interviews, behavioral tasks, or physiological indices). Moreover, subsequent studies should explore additional moderating and mediating variables, such as the role of social support, temperament, or personality traits, in the relationship between childhood trauma, attachment, schema modes, and emotional breakdown. Finally, intervention studies evaluating the efficacy of schema mode-focused therapies in preventing or reducing emotional breakdown following relational loss are needed to inform evidence-based practice.

## Conclusions

In summary, the present study advances understanding of the psychological mechanisms underlying emotional breakdown following romantic relationship dissolution among young adults, particularly medical students. The findings underscore the significant and independent contributions of childhood emotional trauma and

insecure attachment styles to increased vulnerability to post-breakup emotional distress. Importantly, this research highlights the mediating role of maladaptive child schema modes, especially the vulnerable, angry, enraged, and impulsive child modes, in translating early adverse experiences and insecure attachment into heightened emotional breakdown. Conversely, the presence of adaptive schema modes, such as the happy child, appears to confer resilience and mitigate distress. These results provide empirical support for the schema therapy model and suggest that interventions targeting maladaptive schema modes, alongside fostering secure attachment, may be especially beneficial for individuals coping with relational loss. While the study's cross-sectional design and sample characteristics limit generalizability, the findings offer valuable directions for both clinical practice and future research. Longitudinal and intervention studies in more diverse populations are recommended to further elucidate these pathways and to evaluate the effectiveness of schema mode-focused therapeutic approaches in alleviating emotional breakdown. Overall, this study emphasizes the importance of addressing both developmental and cognitive-emotional factors in the prevention and treatment of intense psychological distress following romantic relationship dissolution.

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Informed consent: informed consent was obtained from participants for their involvement in the study, and their information was used with complete confidentiality.

Participant consent for publication: all participants provided informed consent, were fully informed about the study, and their anonymized data was used ethically, following all research guidelines.

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