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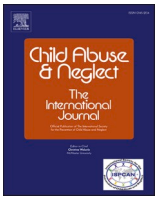

Focus on and venting of emotion mediate the pathway from maternal child abuse to adulthood depression severity

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ABSTRACT

Background: Exposure to parent-perpetrated child abuse is a risk factor for adulthood major depressive disorder (MDD). Coping strategies may be a plausible mechanism underlying this relationship. The current study examined whether positive reinterpretation (PR), focus on and venting of emotion (FVE), and behavioral disengagement (BD) mediated the relationship between maternal or paternal abuse and adulthood MDD symptoms.
Method: Data from 3294 community-dwelling adults were collected across three waves, with each interval nine years apart. Structural equation mediation modeling examined whether each unique coping strategy at Wave 2 mediated the relationship between maternal or paternal abuse at Wave 1 and MDD symptoms at Wave 3, controlling for baseline MDD symptoms. Both Wave 1 maternal and paternal abuse were entered simultaneously into each of the three mediation models.
Results: PR did not mediate the relationship between recalled parent-perpetrated child abuse and MDD severity (standardized $\beta = 0.001$ to 0.002). BD and FVE mediated the relationship between maternal abuse and MDD severity ($\beta = 0.006$ to 0.020) but not paternal abuse (both βs $= -0.003$). Maternal abuse was associated with higher BD and FVE ($\beta = 0.175$ to 0.628), which were both associated with increased MDD severity ($\beta = 0.086$ to 0.112).
Discussion: BD and FVE are possible mechanisms linking childhood experiences to adulthood MDD severity. Identifying maladaptive coping as mediators highlights its role in shaping long-term mental health. Targeting these coping patterns may help reduce the enduring impact of child abuse on adult mental health, reinforcing the importance of early prevention.

Parent-perpetrated child abuse, which includes emotional, physical, and severe physical maltreatment carried out by mothers or fathers, plays a major role in the global burden of disease and disability (Madigan et al., 2023). In the United States alone, approximately 160 million adults have experienced at least one adverse childhood experience (ACE), including parent-perpetrated child abuse, contributing to an estimated annual economic cost of $14.1 trillion (Peterson et al., 2023). Most instances of parent-perpetrated child abuse are inflicted by biological or custodial parental figures, and approximately 80% of cases involve either the mother or father (Hughes et al., 2017). Although parent-perpetrated child abuse is often examined within the broader ACEs framework, the ACEs construct combines diverse forms of adversity that differ substantially in their origins, interpersonal dynamics, and mechanisms of harm. Abuse perpetrated by parents constitutes a distinct adversity marked by betrayal from primary attachment figures and may

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affect development through pathways that differ from those associated with experiences such as community violence or peer victimization. Consequently, many clinicians and researchers acknowledge the critical importance of identifying the mental health consequences of parent-perpetrated child abuse, highlighting their relevance in developing effective prevention and treatment strategies for public health (Norman et al., 2012).

Heightened levels of major depressive disorder (MDD) severity in adulthood have long been recognized as a consequence of retrospectively recalled parent-perpetrated child abuse. This proposition is supported by recent decades of research, with a meta-analysis of 190 cross-sectional studies establishing that greater exposure to parent-perpetrated child abuse considerably increased the likelihood of a depression diagnosis in adulthood (Humphreys et al., 2020). Reinforcing this finding, a meta-analysis of 96 longitudinal, cross-sectional, and case-control studies demonstrated that all forms of child abuse, including emotional, physical, and sexual abuse, were strongly associated with the development of elevated MDD symptoms (Gardner et al., 2019). The broader mental health implications of child abuse are also well-documented. A meta-analysis of 34 quasi-experimental, cross-sectional, and longitudinal studies highlighted a clear link between great exposure to parent-perpetrated child abuse and various mental health problems, e.g., depression, anxiety, eating disorders, and substance use (Baldwin et al., 2023). Additionally, more parent-perpetrated child abuse encounters are associated with elevated risks of suicidality, as shown in a meta-analysis of 68 cross-sectional studies, which reported increased odds of suicidal thoughts and behaviors in adulthood among those with histories of abuse (Angelakis et al., 2019).

Despite the well-established association between recalled parent-perpetrated child abuse and the development of MDD in adulthood, the specific mechanisms mediating this connection remain uncertain (Baldwin et al., 2023). Moreover, not all children who experience abuse go on to develop heightened MDD symptoms, highlighting that there may be mechanisms in this association that could be targeted in prevention and treatment efforts. Certain modifiable factors within a potentially causal chain could either exacerbate vulnerability to depression or act as protective buffers against it over long durations. Thus, understanding these potential mechanisms is crucial for developing effective interventions to mitigate the long-term psychological effects of parent-perpetrated child abuse.

Three specific coping strategies are theorized to serve as mechanisms through which parent-perpetrated child abuse might contribute to increased severity of MDD: (i) positive reinterpretation (PR; when an individual tries to find a positive meaning or growth opportunity in a stressful situation); (ii) behavioral disengagement (BD; reducing one's efforts to deal with a stressor, effectively withdrawing, or giving up the attempt to cope with the problem); and (iii) focus on and venting of emotion (FVE; an increased awareness of one's emotional distress and actively expressing or discharging those feelings). According to the *functional adaptations model*, coping strategies are adaptive responses to environmental challenges. What might initially be perceived as maladaptive coping could, in specific contexts, function as an adaptation to suboptimal environments (Wadsworth, 2015). The *response styles theory* posits that rumination exacerbates depression by intensifying negative thinking and hindering problem-solving abilities, which is also associated with higher levels of MDD symptoms over time (Nolen-Hoeksema et al., 2008). Notably, rumination is positively linked to avoidant coping (Ehring, 2021). FVE parallels rumination, as both processes involve a non-constructive fixation on emotional experiences and past events (Marr et al., 2022). Although FVE might offer temporary relief, if not managed properly, it could result in ruminative patterns that fuel MDD symptoms. Relatedly, BD, defined as withdrawal from psychosocial engagements in ways that reinforce avoidance patterns (Hong, 2007), might mediate the pathway of recalled parent-perpetrated child abuse evolving into elevated adulthood MDD. Further, BD might perpetuate MDD symptoms by reinforcing avoidance patterns. When individuals withdraw from challenges and opportunities due to feelings of helplessness, they could become ensnared in a cycle of avoidance that intensifies their depressive state (cf. *learned helplessness theory*; Miller & Seligman, 1975). Response styles theory also suggests that adaptive emotion-focused coping strategies, such as PR, may serve as protective factors. By encouraging individuals to reframe traumatic experiences in a more empowering light, PR could foster resilience and mitigate the emotional impact of prior parent-perpetrated child abuse experiences (Nolen-Hoeksema et al., 2008).

Five empirical studies have investigated the role of coping strategies related to PR, BD, and FVE as mediators in the relationship between parent-perpetrated child abuse and depression. A longitudinal study with a 20-year follow-up identified avoidant emotion-focused coping, like BD and FVE, as a risk factor between ACEs, including parent-perpetrated child abuse, and later psychiatric and physical health outcomes (Sheffler et al., 2019). Four other cross-sectional studies illustrated a similar pattern. Greater negative coping styles mediated the positive association between parent-perpetrated child abuse and MDD (Li et al., 2024). Additionally, PR and growth served as the most protective factor among active coping styles for depression, whereas passive coping, involving avoidance patterns, functioned as a risk factor for depression (Roohafza et al., 2014). Among adolescents, BD was correlated with depression, and specific problem-focused coping strategies were not independently associated with lower depression (Horwitz et al., 2011). Moreover, negative coping styles mediated the link between parent-perpetrated child abuse and depression among Chinese female college students (Zheng et al., 2020). Although these findings highlight the critical role of coping strategies, there remains a lack of studies examining coping as a mediator in the relationship between parent-perpetrated child abuse and adulthood MDD.

Previous studies investigating the relationship between parent-perpetrated child abuse and depression have several limitations that we aimed to address. Most notably, except for the study by Sheffler et al. (2019), all other studies on this topic were cross-sectional, which limits our ability to determine the temporal order of associations and to draw causal inferences about the mediating effects of coping strategies. Mediation analyses ideally require three assessment waves to effectively capture temporal dynamics and mediational pathways (Cole & Maxwell, 2003; Maxwell & Cole, 2007). Additionally, many previous studies grouped multiple coping strategies into broad categories, such as positive versus negative coping or emotion-focused versus problem-focused coping, thereby reducing the precision of their findings. Further, much of the research has focused on a single coping strategy as a mediator. In contrast, our study examines three unique coping mechanisms. Additionally, our study employed a longitudinal design. It investigated specific, theory-driven coping strategies (PR, BD, and FVE), offering a more detailed and comprehensive understanding of how these strategies

mediate the impact of recalled parent-perpetrated child abuse on heightened adulthood MDD. By addressing these limitations, we aimed to fill critical knowledge gaps.

Therefore, we aimed to address a crucial translational question: what are key potential mechanisms to mitigate the impact of recalled parent-perpetrated child abuse on the severity of MDD in adulthood? Based on the outlined theories and logic, these hypotheses were tested: higher BD and FVE, coupled with lower PR usage, were expected to mediate the relationship between higher recalled childhood maternal and paternal abuse and 18-year MDD severity. In other words, greater recalled childhood maternal and paternal abuse was hypothesized to be associated with increased reliance on 9-year maladaptive coping strategies (higher BD and FVE) and reduced use of PR, which would subsequently relate to higher levels of 18-year MDD severity, even after accounting for baseline symptoms.

1. Method

1.1. Participants

At W1, participants had a mean age of 46.65 years ($SD = 10.35$, range 20–86), 54.95% were female (the remaining were male), and 42% had a college education or above. The racial composition was 89.7% White, 3.3% African American, and 7.0% Asian, Native American, Pacific Islander, other ethnicities, or participants who declined to disclose their ethnicity. Participants were community-dwelling, non-institutionalized adults recruited from the general population. The proportions of participants who met criteria for W1 MDD and W3 MDD were 11.7% and 9.93%, respectively. Participants were drawn from the MIDUS study, a longitudinal cohort designed to examine how biopsychosocial factors influence health throughout adulthood. Initially, 7108 individuals aged 25–74 were recruited in 1995–1996 (Wave 1; W1) through random-digit dialing. Inclusion criteria required participants to have relevant data from all three waves: 1995–1996 (W1), 2004–2005 (Wave 2; W2), and 2012–2013 (Wave 3; W3; Brim et al., 2020; Ryff et al., 2019). While 7108 participants were included at W1 and 4963 at W2, only 3294 completed all waves of the MIDUS study and were thus included in this analysis. The current study involved secondary data analysis of a publicly available dataset and did not require additional Institutional Review Board approval.

1.2. Procedures

This study utilized data from 3294 participants who completed telephone interviews or self-reported measures assessing the severity of MDD symptoms at W1 and W3. Data collection in W1 involved both telephone interviews and self-administered questionnaires (SAQs), while the second (W2) and third (W3) waves were collected primarily through SAQs. For participants who did not complete the SAQs at any assessment waves, modified versions of the assessments were administered via telephone (Brim et al., 2020; Ryff et al., 2019). Measures evaluating the frequency of recalled child abuse were administered at W1, whereas coping strategies were assessed at W2.

1.3. Measures

1.3.1. W1 recalled parent-perpetrated child abuse

Parental abuse incidents were retrospectively self-reported through the Revised Conflict Tactics Scale (CTS2; Straus et al., 1996). This scale assessed parent-perpetrated child abuse across three domains: emotional abuse, physical abuse, and severe physical abuse. Respondents rated their experiences on a 4-point Likert scale, ranging from 1 (*Never*) to 4 (*Often*). Each category was independently rated for abuse incidents involving the respondent's maternal or primary female caregiver and paternal or primary male caregiver (Straus et al., 1996). For emotional abuse, respondents indicated whether the perpetrators engaged in behaviors like “did or said something to spite you, insulted you or swore at you, sulked or refused to talk to you, smashed or kicked something in anger, stomped out of the room, or threatened to hit you.” For physical abuse, respondents reported whether the perpetrators “threw something at you, slapped you, or pushed, grabbed, or shoved you.” Lastly, severe physical abuse was assessed through one item, where respondents noted if the perpetrators “beat you up, burned or scalded you, choked you, hit or tried to hit you with something, or kicked, bit, or hit you with a fist.” Our CTS2 scores demonstrated acceptable internal consistency, with MacDonald's omega (ω) values of .711 for maternal abuse and .709 for paternal abuse (Dunn et al., 2014). Macdonald's ω was used to assess reliability, acknowledging the limitations of Cronbach's alpha (α), which presumes equal variances in true scores, perfect correlations, and uncorrelated error variances among items (Dunn et al., 2014). The CTS2 has also demonstrated strong construct validity and psychometric reliability across various sample populations (Chapman & Gillespie, 2019). Convergent and discriminant validity were evidenced by large associations with another measure of emotional abuse and physical abuse, and small links to unique constructs (Ng et al., 2024). Continuous scales were employed to measure W1 recalled parent-perpetrated child abuse (i.e., scores across each CTS2 domain).

1.3.2. W2 coping strategies

The COPE Inventory subscales, each comprising four items, were used to measure PR, FVE, and BD (Carver et al., 1989). Participants rated items on a 4-point Likert scale (1 = *not at all* to 4 = *a lot*) to assess trait-level PR, BD, and FVE. Continuous scales were employed to measure W2 coping strategies. PR was measured using four items (e.g., “I look for something good in what is happening”). The four-item PR scale had good internal consistency ($\alpha = .800$), acceptable two-week retest reliability, and strong construct validity (Carver et al., 1989). Convergent validity for PR was evidenced by large associations with positive reappraisal ($r = 0.70$; Wrosch et al.,

2000). FVE was measured by four items (e.g., "I feel a lot of emotional distress and find myself expressing those feelings a lot"). Likewise, the four-item FVE scale showed good internal consistency (α = .820 herein), acceptable two-week retest reliability, and strong construct validity (Carver et al., 1989). Convergent validity for FVE was evidenced by moderate associations with aggression (*r* = 0.40; Patrick et al., 2002; Tellegen, 1985). Similarly, a four-item scale captured BD (e.g., "I admit to myself that I can't deal with it and quit trying"). This scale had strong internal consistency (α = .72 herein), good two-week retest reliability, and excellent construct validity (Carver et al., 1989). BD demonstrated moderate convergent validity with measures of trait anxiety and related constructs (Carver et al., 1989) as well as good discriminant validity with unrelated concepts (Carver et al., 1989).

1.3.3. W1 and W3 MDD severity

The severity of MDD symptoms was determined based on the criteria from the Diagnostic and Statistical Manual of Mental

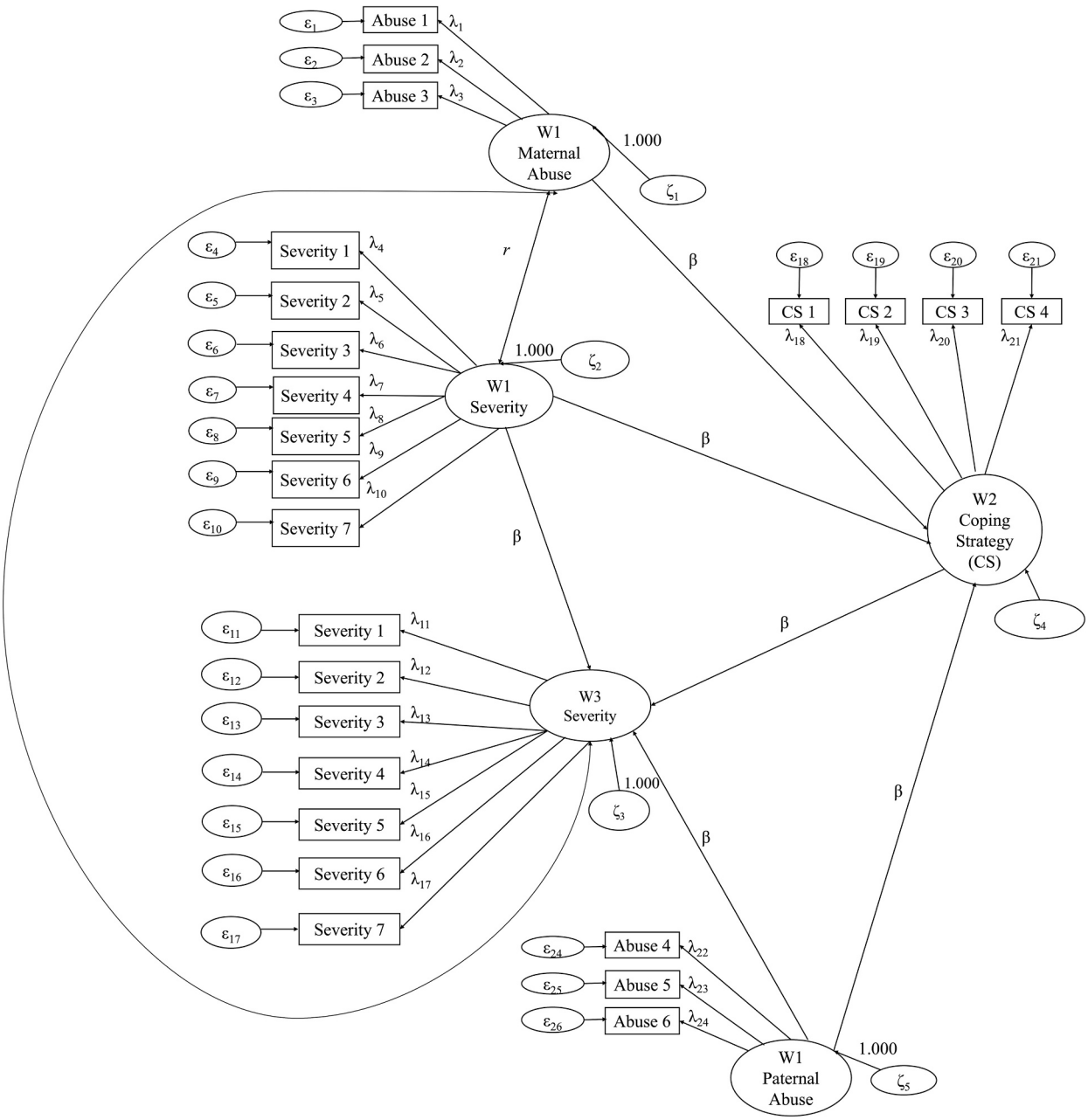

Fig. 1. Generic example diagram for longitudinal mediation analysis.
Note. ε, residual error variance; λ, latent factor loading; ζ, residual latent variance; β, standardized regression estimate; *r*, latent correlation; W1, wave 1; W2, wave 2; W3, wave 3.

Disorders-Revised-Third Edition (DSM-III-R; American Psychiatric Association, 1987) using the World Health Organization's Composite International Diagnostic Interview-Short Form (CIDI-SF; Kessler et al., 1998). A continuous scale was employed to measure MDD symptoms linked to loss of pleasure and depressed mood for at least two weeks over the past 12 months (Kessler et al., 1998). MDD severity was rated on a scale from 0 (*lowest depression*) to 7 (*highest depression*). This assessment focused on MDD symptoms related to depressed mood and anhedonia, covering seven items: changes in appetite, difficulty concentrating, fatigue, loss of interest in most activities, low self-esteem, sleep disturbances, and thoughts of death (ω = .960 and .970 at W1 and W3, respectively). Continuous scales were employed to measure W1 and W3 MDD severity.

1.4. Data analyses

As part of the preprocessing step, the values of four relevant items representing the PR scale were summed to create a composite score. Similarly, the values of four items related to the BD scale and the values of four items corresponding to the FVE scale were also summed. Descriptive statistics and other data management steps were computed using the *dplyr* package in *R* (Wickham et al., 2023). Descriptive statistics of the study variables are presented in Table S1 in the online supplemental materials (OSM).

Missing data, which comprised 26.4% of the total dataset with the variables of interest, was addressed through multiple imputation using the *mice R* package (van Buuren & Groothuis-Oudshoorn, 2011). The current dataset was missing completely at random (MCAR; Little's MCAR test: $\chi^2(df = 8949) = 7596, p = 1.000$). Further, multiple imputation, a gold-standard approach, accounts for uncertainty by producing multiple plausible imputed datasets, yielding unbiased estimates and standard errors, unlike alternative methods such as complete-case analysis and mean imputation (Buuren, 2018; Lee & Shi, 2021). Before conducting the structural equation modeling (SEM) mediation analyses, the dataset was screened for univariate and multivariate normality, outliers, and multicollinearity. Our preprocessing analysis using Mahalanobis distances indicated no univariate or multivariate outliers. Consistent with community-based samples, MDD symptom scores were highly concentrated at zero, with most participants reporting no symptoms at either W1 (86.3%)

Table 1
W1 recalled CPA predicting W3 MMD severity via W2 positive reinterpretation and growth, controlling for W1 MDD severity.

Estimate	*b*	(*SE*)	*z*	*p*	LCI	UCI
Factor loadings						
W1 maternal emotional abuse	1.000	(0.000)	–	–	1.000	1.000
W1 maternal physical abuse	0.936	(0.020)	45.957	**.000**	0.896	0.976
W1 maternal severe physical abuse	0.531	(0.021)	24.990	**.000**	0.489	0.573
W1 paternal emotional abuse	1.000	(0.000)	–	–	1.000	1.000
W1 paternal physical abuse	0.822	(0.017)	48.085	**.000**	0.788	0.855
W1 paternal severe physical abuse	0.516	(0.017)	30.768	**.000**	0.483	0.549
W2 positive reinterpretation and growth (PR) item 1	1.000	(0.000)	–	–	1.000	1.000
W2 positive reinterpretation and growth (PR) item 2	1.086	(0.034)	31.525	**.000**	1.018	1.153
W2 positive reinterpretation and growth (PR) item 3	1.246	(0.036)	34.153	**.000**	1.175	1.318
W2 positive reinterpretation and growth (PR) item 4	0.980	(0.029)	34.162	**.000**	0.924	1.036
W3 MDD severity item 1	1.000	(0.000)	–	–	1.000	1.000
W3 MDD severity item 2	0.409	(0.012)	35.245	**.000**	0.386	0.432
W3 MDD severity item 3	0.770	(0.025)	31.290	**.000**	0.722	0.818
W3 MDD severity item 4	0.911	(0.019)	49.024	**.000**	0.875	0.948
W3 MDD severity item 5	0.684	(0.026)	26.057	**.000**	0.633	0.736
W3 MDD severity item 6	0.647	(0.027)	23.770	**.000**	0.593	0.700
W3 MDD severity item 7	1.306	(0.054)	24.333	**.000**	1.201	1.411
W1 MDD severity item 1	1.000	(0.000)	–	–	1.000	1.000
W1 MDD severity item 2	0.414	(0.012)	34.525	**.000**	0.391	0.438
W1 MDD severity item 3	0.787	(0.026)	30.543	**.000**	0.737	0.838
W1 MDD severity item 4	0.981	(0.019)	51.609	**.000**	0.944	1.018
W1 MDD severity item 5	0.727	(0.026)	28.296	**.000**	0.677	0.777
W1 MDD severity item 6	0.645	(0.027)	24.060	**.000**	0.592	0.697
W1 MDD severity item 7	1.569	(0.049)	31.708	**.000**	1.472	1.666
Regression estimates						
W1 maternal abuse → W2 PR	−0.034	(0.020)	−1.661	.097	−0.073	0.006
W1 paternal abuse → W2 PR	−0.010	(0.015)	−0.718	.473	−0.039	0.018
W2 PR → W3 MDD severity	−0.011	(0.006)	−1.819	.069	−0.023	0.001
W1 maternal abuse → W3 MDD severity	0.027	(0.007)	4.023	**.000**	0.014	0.040
W1 paternal abuse → W3 MDD severity	0.003	(0.005)	0.626	.532	−0.006	0.012
W1 MDD severity → W3 MDD severity	0.257	(0.026)	9.861	**.000**	0.206	0.308
Indirect and total effects						
W1 maternal abuse → W2 PR → W3 MDD severity	0.000	(0.000)	1.271	.204	0.000	0.001
W1 paternal abuse → W2 PR → W3 MDD severity	0.000	(0.000)	0.665	.506	0.000	0.000
Total effect	0.030	(0.005)	6.485	**.000**	0.021	0.039

Note. CPA = childhood parental abuse; *b* = regression weight; *SE* = standard error; *z* = *z*-value of the parameter estimate; LCI = lower bound of the 95% confidence intervals (CIs); UCI = upper bound of the 95% CIs; W1 = Wave 1; W2 = Wave 2; W3 = Wave 3; MDD = major depressive disorder; PR = positive reinterpretation and growth.
Bold values denote parameter estimates that were statistically significant at the $p < .05$ alpha threshold.

or W3 (87.9%). The distributions were also notably right-skewed and more peaked than a normal distribution, reflecting the non-clinical nature of the sample. Given these pronounced departures from normality, analyses were conducted using robust maximum likelihood (MLR) estimation with robust standard errors, which provides valid inferences under violations of normality assumptions (Maydeu-Olivares, 2017). No signs of multicollinearity were observed (all variance inflation factor [VIF] values were < 1.5).

Fig. 1 provides a generic schematic mediation model. To evaluate the fit of the SEM model using the *lavaan R* package (Rosseel, 2012), we used the chi-square (χ^2) statistic (Hu & Bentler, 1999), the model degrees of freedom, as well as the associated degrees of freedom and probability (*p*) values (Kline, 2023). A satisfactory fit was indicated by confirmatory fit index (CFI) values ranging from .90 to 1.0 (Bentler, 1990). For the root mean square error of approximation (RMSEA) and standardized root mean square residual (SRMR), values below .10 suggested an acceptable fit (Hu & Bentler, 1999; Steiger, 1990). SEM mediation analyses were performed using the product-of-coefficients method to examine the indirect effect, where W1 recalled childhood maternal/paternal abuse served as predictors of W2 PR/FVE/BD ("*a* path") and W2 PR/FVE/BD as predictors of W3 MDD severity ("*b* path"). Standardized regression coefficients (β) and *p*-values were reported, with bootstrapping involving 2000 resampling iterations and MLR estimators used to compute standard errors (Cheung & Lau, 2008). These 2000 bootstrapped samples were chosen as they suffice to generate reliable and stable 95% confidence intervals for the indirect mediation effects (Mackinnon et al., 2004). Despite other studies using 5000 bootstraps, 2000 were sufficient to achieve these goals, with minimal incremental benefits in precision beyond this point, balancing analytic rigor and computation time (Fritz & Mackinnon, 2007).

The mediation effect size quantified the proportion of the indirect effect ($a * b$) to the total effect ($c = a * b + c'$; Preacher & Kelley, 2011), expressed as the percentage of variance explained by the focal mediator in the relationship between recalled child abuse by primary maternal or paternal figures and MDD severity. W1 outcome variables, including W1 MDD severity, were controlled for in all models of W3 MDD severity. By controlling for W1 MDD symptoms, the model assesses the association between predictors and the relative level of W3 MDD severity (i.e., rank-order stability), rather than predicting absolute symptom change or the onset of new cases. However, we did not control for W1 PR/FVE/BD, as causal inference principles caution that controlling for baseline variables

Table 2
W1 recalled CPA predicting W3 MMD severity via W2 behavioral disengagement, controlling for W1 MDD severity.

Estimate	*b*	(*SE*)	*z*	*p*	LCI	UCI
Factor loadings						
W1 Maternal emotional abuse	1.000	(0.000)	–	–	1.000	1.000
W1 Maternal physical abuse	0.937	(0.020)	46.102	**.000**	0.897	0.977
W1 Maternal severe physical abuse	0.531	(0.021)	24.980	**.000**	0.489	0.573
W1 Paternal emotional abuse	1.000	(0.000)	–	–	1.000	1.000
W1 Paternal physical abuse	0.822	(0.017)	48.055	**.000**	0.788	0.855
W1 Paternal severe physical abuse	0.516	(0.017)	30.785	**.000**	0.483	0.549
W2 Behavioral disengagement (BD) item 1	1.000	(0.000)	–	–	1.000	1.000
W2 Behavioral disengagement (BD) item 2	1.097	(0.047)	23.103	**.000**	1.004	1.190
W2 Behavioral disengagement (BD) item 3	1.149	(0.048)	23.824	**.000**	1.055	1.244
W2 Behavioral disengagement (BD) item 4	0.963	(0.042)	22.784	**.000**	0.880	1.046
W3 MDD severity item 1	1.000	(0.000)	–	–	1.000	1.000
W3 MDD severity item 2	0.409	(0.012)	35.213	**.000**	0.386	0.432
W3 MDD severity item 3	0.770	(0.025)	31.258	**.000**	0.722	0.819
W3 MDD severity item 4	0.911	(0.019)	48.982	**.000**	0.875	0.948
W3 MDD severity item 5	0.684	(0.026)	26.033	**.000**	0.633	0.736
W3 MDD severity item 6	0.647	(0.027)	23.748	**.000**	0.593	0.700
W3 MDD severity item 7	1.306	(0.054)	24.309	**.000**	1.201	1.411
W1 MDD severity item 1	1.000	(0.000)	–	–	1.000	1.000
W1 MDD severity item 2	0.414	(0.012)	34.524	**.000**	0.391	0.438
W1 MDD severity item 3	0.787	(0.026)	30.544	**.000**	0.737	0.838
W1 MDD severity item 4	0.981	(0.019)	51.609	**.000**	0.944	1.018
W1 MDD severity item 5	0.727	(0.026)	28.296	**.000**	0.677	0.777
W1 MDD severity item 6	0.645	(0.027)	24.060	**.000**	0.592	0.697
W1 MDD severity item 7	1.569	(0.049)	31.707	**.000**	1.472	1.666
Regression estimates						
W1 maternal abuse → W2 BD	0.081	(0.021)	3.894	**.000**	0.040	0.121
W1 paternal abuse → W2 BD	–0.026	(0.015)	−1.788	.074	−0.055	0.003
W2 BD → W3 MDD severity	0.015	(0.007)	2.216	.027	0.002	0.029
W1 maternal abuse → W3 MDD severity	0.026	(0.007)	3.895	.000	0.013	0.039
W1 paternal abuse → W3 MDD severity	0.003	(0.005)	0.740	.459	−0.006	0.012
W1 MDD severity → W3 MDD severity	0.255	(0.026)	9.792	.000	0.204	0.306
Indirect and total effects						
W1 maternal abuse → W2 BD → W3 MDD severity	0.001	(0.001)	1.974	**.048**	0.000	0.002
W1 paternal abuse → W2 BD → W3 MDD severity	0.000	(0.000)	−1.451	.147	−0.001	0.000
Total effect	0.030	(0.005)	6.495	**.000**	0.021	0.039

Note. CPA = childhood parental abuse; *b* = regression weight; *SE* = standard error; *z* = z-value of the parameter estimate; LCI = lower bound of the 95% confidence intervals (CIs); UCI = upper bound of the 95% CIs; W1 = Wave 1; W2 = Wave 2; W3 = Wave 3; MDD = major depressive disorder; BD = behavioral disengagement.
Bold values denote parameter estimates that were statistically significant at the p < .05 alpha threshold.

could introduce bias by partially blocking the mediator's causal effect (D'Onofrio et al., 2020; Rosenbaum, 1984). An alpha correction method was applied (Simes, 1986). Finally, sensitivity analyses were conducted to assess the extent to which the pattern of mediation findings remained similar after adjusting for eight covariates: age, sex, race–ethnicity, education, income, 30-day number of medications (including psychotropic medications), 12-month medical visits, and 12-month mental health visits.

2. Results

2.1. Examining W2 PR mediating the effect of W1 parent-perpetrated child abuse on W3 MDD severity

The model examining PR as a mediator of parent-perpetrated child abuse, and its association with adulthood MDD severity had good fit ($\chi^2(df = 243) = 1338.60$, $p < .001$, CFI = .960, RMSEA = .055, SRMR = .028; Table 1). Neither maternal abuse ("*a1* path": $\beta = -0.051$, $p = .097$) nor paternal abuse ("*a2* path": $\beta = -0.022$, $p = .473$) was significantly associated with PR. In addition, PR was not significantly related to future MDD severity ("*b* path": $\beta = -0.036$, $p = .069$). Moreover, the indirect effects of maternal abuse ("*a1b* path": $\beta = 0.002$, $p = .204$) and paternal abuse ("*a2b* path": $\beta = 0.001$, $p = .506$) on future MDD severity were not statistically significant.

2.2. Examining W2 BD mediating the effect of W1 parent-perpetrated child abuse on W3 MDD severity

The model examining BD as a mediator of parent-perpetrated child abuse, and its association with adulthood MDD severity had good fit ($\chi^2(df = 243) = 1217.14$, $p < .001$, CFI = .963, RMSEA = .051, SRMR = .032; Table 2). Maternal abuse ("*a1* path": $\beta = 0.628$, $p < .001$) was significantly associated with BD, but paternal abuse was not ("*a2* path": $\beta = 0.126$, $p = .074$). In addition, BD was significantly positively associated with future MDD severity ("*b* path": $\beta = 0.086$, $p = .027$). Moreover, the indirect effect of maternal

Table 3
W1 recalled CPA predicting W3 MDD severity via W2 focus on and venting of emotion, controlling for W1 MDD severity.

Estimate	*b*	(*SE*)	*z*	*p*	LCI	UCI
Factor loadings						
W1 maternal emotional abuse	1.000	(0.000)	–	–	1.000	1.000
W1 maternal physical abuse	0.930	(0.020)	45.935	**.000**	0.890	0.970
W1 maternal severe physical abuse	0.529	(0.021)	24.953	**.000**	0.488	0.571
W1 paternal emotional abuse	1.000	(0.000)	–	–	1.000	1.000
W1 paternal physical abuse	0.821	(0.017)	48.079	**.000**	0.787	0.854
W1 paternal severe physical abuse	0.516	(0.017)	30.769	**.000**	0.483	0.548
W2 focus on and venting of emotion (FVE) item 1	1.000	(0.000)	–	–	1.000	1.000
W2 focus on and venting of emotion (FVE) item 2	0.929	(0.025)	37.882	**.000**	0.881	0.977
W2 focus on and venting of emotion (FVE) item 3	0.851	(0.024)	36.046	**.000**	0.804	0.897
W2 focus on and venting of emotion (FVE) item 4	0.985	(0.026)	38.639	**.000**	0.936	1.035
W3 MDD severity item 1	1.000	(0.000)	–	–	1.000	1.000
W3 MDD severity item 2	0.409	(0.012)	34.957	**.000**	0.386	0.432
W3 MDD severity item 3	0.770	(0.025)	31.021	**.000**	0.721	0.819
W3 MDD severity item 4	0.911	(0.019)	48.645	**.000**	0.875	0.948
W3 MDD severity item 5	0.684	(0.026)	25.847	**.000**	0.633	0.736
W3 MDD severity item 6	0.647	(0.027)	23.575	**.000**	0.593	0.700
W3 MDD severity item 7	1.306	(0.054)	24.134	**.000**	1.200	1.412
W1 MDD severity item 1	1.000	(0.000)	–	–	1.000	1.000
W1 MDD severity item 2	0.414	(0.012)	34.520	**.000**	0.391	0.438
W1 MDD severity item 3	0.787	(0.026)	30.548	**.000**	0.737	0.838
W1 MDD severity item 4	0.981	(0.019)	51.606	**.000**	0.944	1.018
W1 MDD severity item 5	0.727	(0.026)	28.293	**.000**	0.677	0.777
W1 MDD severity item 6	0.645	(0.027)	24.059	**.000**	0.592	0.697
W1 MDD severity item 7	1.569	(0.049)	31.701	**.000**	1.472	1.666
Regression estimates						
W1 maternal abuse → W2 FVE	0.157	(0.029)	5.491	**.000**	0.101	0.214
W1 paternal abuse → W2 FVE	−0.020	(0.020)	−0.960	.337	−0.060	0.020
W2 FVE → W3 MDD severity	0.025	(0.005)	5.099	**.000**	0.015	0.035
W1 maternal abuse → W3 MDD severity	0.023	(0.007)	3.499	**.000**	0.010	0.037
W1 paternal abuse → W3 MDD severity	0.003	(0.005)	0.749	.454	−0.006	0.012
W1 MDD severity → W3 MDD severity	0.239	(0.026)	9.247	**.000**	0.189	0.290
Indirect and total effects						
W1 maternal abuse → W2 FVE → W3 MDD severity	0.004	(0.001)	3.716	**.000**	0.002	0.006
W1 paternal abuse → W2 FVE → W3 MDD severity	0.000	(0.001)	−0.943	.346	−0.002	0.001
Total effect	0.030	(0.005)	6.580	**.000**	0.021	0.039

Note. CPA = childhood parental abuse; *b* = regression weight; *SE* = standard error; *z* = *z*-value of the parameter estimate; LCI = lower bound of the 95% confidence intervals (CIs); UCI = upper bound of the 95% CIs; W1 = Wave 1; W2 = Wave 2; W3 = Wave 3; MDD = major depressive disorder; FVE = focus on and venting of emotion.
Bold values denote parameter estimates that were statistically significant at the $p < .05$ alpha threshold.

abuse ("*a1b* path": β = 0.006, $p = .048$) on future MDD severity was statistically significant, whereas the indirect effect of paternal abuse ("*a2b* path": β = −0.003, $p = .147$) on future MDD severity was not statistically significant. More specifically, BD significantly mediated the pathway from maternal abuse to MDD severity in adulthood, accounting for 30.4% of the association between W1 parent-perpetrated child abuse and W3 MDD severity.

2.3. Examining W2 FVE mediating the effect of W1 parent-perpetrated child abuse on W3 MDD severity

The model examining FVE as a mediator of parent-perpetrated child abuse, and its association with adulthood MDD severity had good fit ($\chi^2(df = 243) = 1320.47, p < .001$, CFI = .961, RMSEA = .054, SRMR = .048; Table 3). Maternal abuse ("*a1* path": β = 0.175, $p < .001$) was significantly related to FVE, but paternal abuse did not ("*a2* path": β = −0.029, $p = .337$). In addition, FVE was significantly positively associated with future MDD severity ("*b* path": β = 0.112, $p < .001$). Furthermore, the indirect effect of maternal abuse ("*a1b* path": β = 0.020, $p < .001$) on future MDD severity was statistically significant, whereas the indirect effect of paternal abuse on future MDD severity was not ("*a2b* path": β = −0.003, $p = .346$). FVE mediated the relationship between parent-perpetrated child abuse associated with adulthood MDD severity, accounting for 56.5% of the association between W1 parent-perpetrated child abuse and W3 MDD severity.

2.4. Sensitivity analyses

Four sets of sensitivity analyses were conducted to assess the stability of the mediation results. First, all mediation effects remained the same even when maternal and paternal abuse were modeled separately (OSM Tables S2–S3). Second, when all three mediation models were re-estimated using only complete cases (*Ns* = 2533–2566, depending on the coping strategy), the results closely mirrored those obtained from the full sample with multiple imputation ($N = 3294$), including comparable model fit indices and similar patterns of indirect mediation, direct, and total effects. The nonsignificant mediation findings for PR and for all paternal abuse pathways remained unchanged. Notably, the FVE-mediated pathway linking maternal abuse to subsequent MDD severity continued to reach statistical significance, with standardized indirect effects of similar magnitude. By contrast, the indirect effect from maternal abuse through BD to MDD severity was attenuated in the complete-case analyses, and its 95% confidence interval crossed zero, suggesting reduced precision when analyses were limited to participants with no missing data. Third, increasing the number of bootstrap samples from 2000 to 5000 yielded the same results. Finally, adjusting for age, sex, race–ethnicity, education, income, 30-day number of medications (including psychotropic medications), 12-month medical visits, and 12-month mental health visits did not alter the substantive pattern of findings (see OSM Tables S4–S6).

3. Discussion

We investigated the longitudinal role of coping strategies as mediators in the relationship between recalled parent-perpetrated child abuse and adulthood MDD severity. It aimed to clarify the mechanisms through which recalled parent-perpetrated child abuse contributes to the higher future MDD symptoms. Our findings partially supported our hypotheses. PR did not significantly mediate the relationship between recalled parent-perpetrated child abuse and adult MDD severity. In contrast, BD significantly mediated the pathway from recalled maternal abuse to MDD severity in adulthood, accounting for 30.4% of the association between W1 recalled parent-perpetrated child abuse and W3 MDD severity. Maternal abuse was significantly associated with BD, which consequently was related to greater MDD severity. Similarly, FVE mediated this relationship, accounting for 56.5% of the association between W1 recalled parent-perpetrated child abuse and W3 MDD severity. Maternal abuse was significantly related to FVE, which subsequently was associated with higher MDD severity.

These results build on prior research showing that avoidant emotion-focused coping strategies exacerbate depressive symptoms in adulthood (Sheffler et al., 2019). Unlike earlier studies that employed cross-sectional designs (Horwitz et al., 2011; Li et al., 2024; Zheng et al., 2020), the current study adopted a longitudinal approach, enabling the identification of temporal risk pathways. Although longitudinal work on this topic exists (Sheffler et al., 2019), it did not examine the mediational influence of specific coping strategies. Overall, our results align with and extend the response styles and learned helplessness theories (Miller & Seligman, 1975; Nolen-Hoeksema et al., 2008), supporting the notion that maladaptive coping repertoires contribute to the severity of MDD over time. We proposed plausible explanations for these observations, offering hypothesis-generating ideas for future empirical studies to evaluate and advance clinical psychological science.

Why did BD and FVE mediate the relationship between recalled parent-perpetrated child abuse and adulthood MDD severity? Psychological processes, particularly the modeling role of parents, provide a potential explanation. Children often learn coping behaviors by observing and emulating their parents' reactions to everyday life stressors (Kliewer et al., 1996). However, maltreated parents typically mask emotional expression and engage in hostile, aggressive interactions with family members (Wilson et al., 2008). As a result, children of maltreated parents are less likely to be exposed to healthy coping mechanisms and more likely to model maladaptive strategies like FVE. The expression of negative emotions, particularly through FVE, is linked to poorer daily functioning, strained interpersonal relationships, and increased depressive symptoms (Folkman & Lazarus, 1988; Sempértegui et al., 2017). Consequently, strained relationships may exacerbate adulthood MDD severity by impeding the formation of effective social support networks, which play a key role in symptom reduction (Gariépy et al., 2016).

Another possible explanation is grounded in the learned helplessness theory (Miller & Seligman, 1975). For children exposed to parent-perpetrated child abuse, frequent unpredictable parent-child interactions may contribute to a perceived lack of control over

their environment, fostering a sense of helplessness (Renner & Slack, 2006). This perception can discourage attempts to alter their emotional environment or use active coping strategies, often leading instead to BD, characterized by giving up on goals when faced with stress or challenges, reflecting reduced perseverance (Ginty et al., 2020; Renner & Slack, 2006). Relatedly, in line with the functional adaptations model, chronic exposure to stress, like that stemming from parent-perpetrated child abuse, can lead to the development of coping mechanisms that serve as short-term protection in high-stress contexts but may become maladaptive over time (Wadsworth, 2015). Strategies like BD or FVE may help children maintain psychological stability during adversity, but their continued use can hinder adjustment in less stressful environments. Over time, these strategies can disrupt emotion regulation (ER), strain interpersonal relationships, and heighten MDD severity in adulthood (Wadsworth, 2015). Persistent disengagement from challenges can impair daily functioning, making it more difficult to meet responsibilities at work or school, sustain relationships, and pursue personal goals. Although avoidance may provide temporary relief from stress, it reduces opportunities for positive reinforcement, thereby reinforcing depressive cycles (Kanter et al., 2008). Future longitudinal studies should investigate these ideas to optimize prevention and treatment strategies to reduce the severity of MDD symptoms in adulthood.

The lack of connection between recalled parent-perpetrated child abuse and MDD severity via PR suggests that PR may not explain the relationship between parent-perpetrated child abuse and adulthood MDD severity. Although we did not find direct evidence supporting the mediating role of PR in the link between recalled parent-perpetrated child abuse and MDD severity, research on the mediating role of positive coping strategies in the relationship between parent-perpetrated child abuse and mental health outcomes has been inconclusive. Some studies found that positive coping strategies can moderate or mediate positive mental health (Meng & D'Arcy, 2016; Miller Smedema et al., 2010). In contrast, more recent studies found no mediating effect of positive coping strategies on the relationship between child abuse and MDD (Li et al., 2024; Peláez-Fernández et al., 2021). Deficits in cognitive control can undermine an individual's capacity to adaptively reinterpret situations, thereby limiting the use of effective coping strategies such as PR and increasing reliance on maladaptive alternatives (Joormann & Stanton, 2016). Experiences of parent-perpetrated child abuse are associated with deficits in cognitive control (Rahapsari & Levita, 2024) and executive functioning (Zainal et al., 2025). Consequently, individuals with a history of parent-perpetrated child abuse may struggle to engage in PR, reducing its potential as a protective factor against MDD. Therefore, these individuals may be more likely to rely on maladaptive coping strategies, which can exacerbate depressive symptoms (Nolen-Hoeksema et al., 2008). Future research should examine the impact of cognitive control deficits on the selection and effectiveness of coping strategies among individuals who have experienced parent-perpetrated child abuse.

Interestingly, BD and FVE mediated the relationship between maternal but not paternal abuse and adulthood MDD severity. These findings underscore the criticality of examining maternal and paternal abuse separately (Zainal et al., 2024). Maternal abuse may pose a more immediate risk for adult psychopathology than paternal abuse, possibly due to the greater frequency of interactions children typically have with their mothers (Moretti & Craig, 2013). As discussed earlier, parents are key role models for their children. Mothers, who are often the primary caregivers, play a particularly influential role (Morris et al., 2007). Difficulties in maternal ER may increase the likelihood of unsupportive emotional parenting practices, such as punishing, dismissing, or criticizing children's emotional expressions (Morelen et al., 2016). Consequently, such responses can foster maladaptive coping strategies like BD and FVE.

Finally, sensitivity analyses showed that the BD mediation pathway was nullified after including education and sex as covariates, implying that these sociodemographic variables affected the mediation paths. Research has shown that women are more likely than men to use BD (Oppegaard et al., 2020; Panayiotou et al., 2017), possibly reflecting gendered socialization in emotional displays and help-seeking. Higher education has also been linked to adaptive coping skills, whereas lower education tends to coincide with more maladaptive coping approaches, such as BD (Kilic & Tasgit, 2023). These sociodemographic variations in coping patterns could explain the weakened BD mechanistic pathway after adjusting for education and sex, highlighting the need to account for individual differences and to target treatments in future studies.

Several limitations deserve consideration. First, parental abuse was assessed retrospectively using self-report measures, which could be susceptible to recall bias. Prior research has demonstrated the construct validity and test-retest reliability of retrospective accounts of childhood experiences (Cay et al., 2022). These reports have also been found to remain temporally stable and are marginally influenced by depressive symptomatology (Goltermann et al., 2023). Moreover, subjective reports of maltreatment have been found to better predict psychopathology than objective reports (Danese & Widom, 2020). Relying on objective or prospective measures will likely underestimate the true prevalence of abuse, as only a small proportion of affected children are ever identified by professionals (Baldwin et al., 2019). Collectively, these findings suggest that recall bias is unlikely to significantly influence the retrospective reports of childhood experiences. Second, we assessed parental abuse as a broad construct without distinguishing between specific forms (e.g., emotional versus physical abuse) and their unique contributions to the use of coping strategies and MDD symptom severity. Moreover, sexual abuse and neglect were not considered. This study also did not account for the severity, duration, or timing of abuse, factors that may impact the development of MDD. Future research could investigate the differential effects of these two approaches. Third, only three specific coping strategies (PR, FVE, and BD) were examined. This study did not include other coping strategies, like avoidance, denial, and planning. Denial has been identified as dysfunctional and predictive of MDD severity (Ho et al., 2022). Future studies should investigate how parent-perpetrated child abuse influences the development and use of other coping strategies in adulthood and their potential role as mechanisms linking experiences of parent-perpetrated child abuse to adulthood MDD severity. Fourth, our sample consisted primarily of White, middle- to upper-income individuals. Future research could examine whether these patterns apply to more diverse cultural and socioeconomic groups. Additionally, MDD was assessed herein using the DSM-III-R rather than the most current DSM-5, which should be used in future replication studies. However, the definition of MDD symptoms and severity is largely consistent between the DSM-III-R and DSM-5, with the most notable change being the removal of the bereavement exclusion in DSM-5 (Lamb et al., 2010). Fifth, information on bipolarity was unavailable. However, as the results remained similar upon adjusting for medication use, medical, and mental health visits, bipolarity was unlikely to alter the outcomes.

Sixth, the BD pathway appeared more sensitive to analytic choices and should thus be interpreted with caution. Nonetheless, the sensitivity analyses indicated that the primary conclusion (i.e., FVE serves as a reliable mediator of the association between maternal abuse and adult MDD severity) holds across different approaches to handling missing data. Lastly, while SEM mediation analysis is a robust technique for examining longitudinal relations, it may not fully capture the subtleties of temporal ordering. Future research should investigate the potential serial mediation between BD and FVE to better understand the sequence in which these coping strategies emerge. Clarifying this developmental trajectory could inform the design of targeted early interventions. Establishing a clear temporal direction enables interventions to be structured in the most effective order to address maladaptive coping strategies.

Nonetheless, the study's strengths include its prospective design, which allowed for establishing temporal precedence and evaluating participants' disorder development over a longer course than in previous cross-sectional studies. Additionally, we employed psychometrically reliable and valid measures to assess coping behaviors and utilized gold-standard clinical interviews to determine MDD symptoms. Finally, we emphasize the importance of exploring potential mechanisms in the connection between parent-perpetrated child abuse and adulthood MDD severity, thereby advancing the growing body of research on the mental health consequences of parent-perpetrated child abuse.

In conclusion, BD and FVE, but not PR, mediated the 18-year relationship between childhood maternal abuse and MDD severity in adulthood in the imputed dataset that included all 3294 participants. Although child abuse is a well-established risk factor for depression, our findings highlight the critical role of maladaptive coping in perpetuating MDD symptoms. These strategies not only contribute to emotional dysregulation but also hinder the effectiveness of positive coping. If our findings are replicated, they have key clinical implications, particularly in highlighting the importance of early intervention strategies that prioritize reducing maladaptive responses. Behavioral activation may mitigate BD by re-establishing routines, increasing rewarding activities, and reducing experiential avoidance (Fernández-Rodríguez et al., 2023). Similarly, ER therapy may effectively address FVE by targeting motivational and regulatory mechanisms involved in negative self-referential processing (Renna et al., 2017). Future research should explore whether such interventions can reduce the severity of MDD symptoms later in life. Ultimately, our findings suggest that early adulthood represents a critical window for intervention. Prioritizing the reduction of maladaptive coping strategies like BD and FVE may enhance long-term mental health outcomes for individuals exposed to parent-perpetrated child abuse.

CRediT authorship contribution statement

Jenelle Yingni Tan: Writing – review & editing, Writing – original draft, Visualization, Validation, Investigation, Formal analysis, Data curation, Conceptualization. **Hannah N. Ziobrowski:** Writing – review & editing, Writing – original draft, Validation, Supervision, Conceptualization. **Nur Hani Zainal:** Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization.

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Declaration of competing interest

All authors report no conflicts of interest.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.chiabu.2026.107926.

Data availability

The authors do not have permission to share data.

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