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Cognitive Flexibility as a Mediator of the Association Between Childhood Maltreatment and Entrapment in Adults

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ABSTRACT

Objective: Childhood maltreatment is associated with a range of adverse psychological outcomes, including feelings of entrapment. This study examined whether cognitive flexibility mediates the association between childhood maltreatment and entrapment among adults in Isfahan, Iran.

Methods and Materials: This descriptive-correlational cross-sectional study was conducted on 317 adults. Participants completed the Childhood Trauma Questionnaire, Cognitive Flexibility Inventory, and Entrapment Scale. Data were analyzed using structural equation modeling in AMOS-26. Internal consistency coefficients for the measures were acceptable.

Findings: Childhood maltreatment significantly and negatively predicted cognitive flexibility ($\beta = -0.50$, $p < .001$). Cognitive flexibility significantly and negatively predicted entrapment ($\beta = -0.75$, $p < .001$). Childhood maltreatment also had a significant direct positive effect on entrapment ($\beta = 0.58$, $p < .001$). In addition, the indirect effect of childhood maltreatment on entrapment through cognitive flexibility was significant ($\beta = 0.24$, 95% CI [0.16, 0.36]). The proposed model demonstrated good fit indices ($\chi^2/df = 1.66$, CFI = 0.98, RMSEA = 0.04).

Conclusion: Cognitive flexibility partially mediated the relationship between childhood maltreatment and entrapment. These findings suggest that cognitive flexibility may function as a protective psychological factor in adults exposed to early adversity. Because of the cross-sectional design, causal interpretation should be approached with caution.

Keywords: Childhood maltreatment, cognitive flexibility, entrapment.

Introduction

Childhood maltreatment, including physical, emotional, and sexual abuse as well as neglect, is a major public health concern with long-term implications for emotional regulation, cognitive functioning, and social adjustment (Li et al., 2024; Yang, 2024). These experiences can interfere with neurodevelopmental processes that are critical for self-regulation and executive control. Early adverse experiences disrupt cognitive and emotional systems and increase susceptibility to depression, anxiety, and maladaptive coping, increasing susceptibility across the lifespan (Ion et al., 2023; Krause-Utz et al., 2019).

Entrapment, defined as the persistent perception of being trapped in uncontrollable and aversive circumstances, is recognized as a transdiagnostic factor contributing to distress, hopelessness, and suicidal ideation (Farahmand & Sharooni, 2022; Sayadi et al., 2024). Individuals who perceive their circumstances as inescapable often display impaired emotion regulation and heightened vulnerability to psychological disorders. Although the consequences of childhood maltreatment have been widely documented, the mechanisms explaining how early adversity leads to entrapment remain insufficiently explored (Amédée et al., 2022; Sayadi et al., 2024).

Cognitive flexibility, a core executive function that enables individuals to modify thoughts and behaviors in response to changing environmental demands (Dennis & Vander Wal, 2010), may represent one such mechanism. It facilitates adaptive appraisal, emotion regulation, and effective problem-solving (Başaran et al., 2022). Empirical studies have shown that exposure to childhood maltreatment is associated with lower levels of cognitive flexibility (Huang et al., 2024; Kalia et al., 2021). Reduced flexibility has been linked to rigid cognitive appraisals and repetitive negative thinking that intensify perceptions of powerlessness and entrapment (Amédée et al., 2022; Liu et al., 2021).

Recent findings further emphasize the role of cognitive mechanisms in trauma outcomes, suggesting that lower cognitive flexibility mediates the association between early adverse experiences and heightened psychological distress (Başaran et al., 2022; Kalia et al., 2021). Nevertheless, existing mediation models have predominantly focused on depression or general well-being rather than entrapment, leaving an important gap in understanding the cognitive pathways that connect maltreatment to feelings of being trapped.

Limited attention to cognitive flexibility as a mediator between maltreatment and entrapment may stem from the dominance of affective models of trauma outcomes, heterogeneity in measurement tools, and the prevalence of cross-sectional designs that restrict causal inference. Clarifying this mechanism could inform theoretical models and clinical interventions by identifying modifiable cognitive factors that mitigate the enduring impact of childhood adversity.

Accordingly, this study aimed to examine the mediating role of cognitive flexibility in the relationship between childhood maltreatment and entrapment among adults in Isfahan, Iran.

Methods and Materials

Research Design

This study employed a descriptive-correlational design using structural equation modeling (SEM) to examine the mediating role of cognitive flexibility in the relationship between childhood maltreatment and entrapment among adults in Isfahan, Iran.

Participants and Sampling Procedure

The statistical population included adult residents of Isfahan during the summer of 2024. Following Kline's (2023) recommendation of a minimum of 250 participants for SEM, a total of 320 individuals were recruited via convenience sampling from public locations, including parks, libraries, and healthcare centers. After removing three multivariate outliers based on Mahalanobis distance, the final sample comprised 317 participants.

Convenience sampling was used due to accessibility and feasibility constraints. Although this non-probability method limits generalizability and may introduce sampling bias, several precautions were taken to minimize its impact on SEM path estimates. The sample included participants from multiple districts with diverse educational and marital backgrounds to enhance representativeness. Furthermore, the robustness of the SEM model was assessed using bootstrapping, which helps reduce estimation bias associated with non-random samples.

Although convenience sampling was employed due to accessibility and logistical constraints, it has limitations in generalizability and representativeness, particularly in structural equation modeling (SEM), which ideally requires random sampling. However, given the exploratory nature of the current study and the adequate sample size (N = 317), the use of SEM remains statistically appropriate.

Among these 317 participants, 69 individuals (21.8%) had a diploma, 38 individuals (12.0%) held an associate degree, 196 individuals (61.9%) had a bachelor's degree, 10 individuals (3.1%) held a master's degree, and 4 individuals (1.2%) had a doctoral degree. Regarding gender distribution, 134 participants (42.3%) were male, and 183 participants (57.7%) were female. In terms of marital status, 228 participants (71.9%) were single, and 89 participants (28.1%) were married.

Inclusion criteria were: (1) having at least a high school diploma, (2) residing in Isfahan, (3) no history of psychological disorders, (4) not currently participating in psychotherapy or family therapy, and (5) providing complete responses to the questionnaires. Before completing the questionnaire, each participant underwent an initial interview in which the study's general objectives were explained.

Instruments

The Entrapment Scale (ES): Developed by Gilbert and Allan (1998), this 16-item scale assesses internal and external entrapment using a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree). Total scores range from 16 to 80, with higher scores indicating greater entrapment. Cronbach's alpha was 0.94 for students and 0.93 for depressed individuals in the original study. Previous studies using the Persian adaptation of the Entrapment Scale have reported high internal consistency ($\alpha > 0.90$). In the current study, Cronbach's alpha was 0.81. Before inclusion in the SEM model, a confirmatory factor analysis (CFA) was conducted to verify the two-factor structure (internal and external entrapment). The results indicated an acceptable model fit for the current sample ($\chi^2/df = 2.11$, CFI = 0.96, RMSEA = 0.05), confirming the validity of the bifactor structure. Composite reliability (CR = 0.83) and average variance extracted (AVE = 0.56) were both within acceptable thresholds. Items were screened for univariate and multivariate normality, with skewness and kurtosis values within ±2. Minor wording adjustments were made to ensure linguistic and cultural clarity in Persian translation, following back-translation procedures.

Childhood Trauma Questionnaire (CTQ): Developed by Bernstein et al. (2003) to assess childhood trauma. It consists of 28 items and evaluates five subscales: physical abuse, sexual abuse, emotional abuse, physical neglect, and emotional neglect. Responses are rated on a 5-point Likert scale ranging from 1 (never) to 5 (always). The score range for each subscale is 5 to 25, and the total score ranges from 25 to 125, with higher scores indicating greater levels of childhood trauma. Bernstein et al. (2003) reported the reliability of this instrument using both a two-month test–retest method and Cronbach's alpha, with values ranging from 0.79 to 0.94. Previous studies using the Persian version of the Childhood Trauma Questionnaire have reported good internal consistency ($\alpha = 0.84$). In the present study, Cronbach's alpha was 0.73. A CFA was performed to assess the five-factor structure of the CTQ, yielding good fit indices ($\chi^2/df = 1.97$, CFI = 0.95, RMSEA = 0.06). Convergent validity was supported by AVE values above 0.50 for all subscales, and discriminant validity was confirmed through the Fornell–Larcker criterion. Composite reliability (CR = 0.79) indicated adequate internal consistency beyond Cronbach's alpha. No item showed cross-loading above 0.30, confirming the distinctiveness of the subdimensions.

Cognitive Flexibility Inventory (CFI): Created by Dennis and Vander Wal (2010), this 20-item scale measures cognitive flexibility across three subscales: perceived control over challenging situations, ability to generate alternative explanations for life events, and capacity to produce multiple solutions. Using a 7-point Likert scale, total scores range from 20 to 140, with higher scores indicating greater flexibility. The original study reported convergent validity of 0.75 and reliability of 0.91. Prior validations of the Cognitive Flexibility Inventory have reported excellent internal consistency ($\alpha > 0.90$). In the present study, Cronbach's alpha was .86. CFA results confirmed the inventory's three-factor model, with satisfactory fit indices ($\chi^2/df = 1.88$, CFI = 0.97, RMSEA = 0.04). The composite reliability of the total scale was 0.89, and the AVE value of 0.59 indicated adequate convergent validity. Inter-factor correlations ranged between 0.41 and 0.56, supporting discriminant validity. To control for common method variance, Harman's

single-factor test was applied, showing that no single factor accounted for more than 30% of the total variance, suggesting that common method bias was not a significant concern.

Analysis

Data were analyzed using SPSS-27 and AMOS-26. Preliminary analyses included descriptive statistics and assumption checks (normality, linearity, and homoscedasticity). Multicollinearity was examined via variance inflation factors (VIF < 3.0) and tolerance values (> 0.30), confirming acceptable independence among predictors. The impact of outliers on SEM parameters was further assessed by comparing model estimates before and after outlier removal, which showed minimal deviation (< .02) in standardized path coefficients.

Model evaluation followed conventional SEM fit indices: $\chi^2/df < 3$, CFI > .90, PGFI > .50, and RMSEA < .08. To test the mediating effect of cognitive flexibility, a bias-corrected bootstrap procedure (5,000 resamples) was employed. Bootstrapping provides more accurate confidence intervals than the Sobel test alone, especially when indirect effects deviate from normality (Preacher & Hayes, 2008).

Ethical Considerations

Ethical approval was obtained (code: IR.UI.REC.1403.092). Participants provided informed consent after being briefed on the study's purpose and confidentiality protocols. Data were anonymized and stored securely.

Findings and Results

Descriptive Statistics and Correlations

Preliminary analyses were conducted to examine the distributional properties and bivariate relationships among the study variables. All variables demonstrated acceptable levels of skewness and kurtosis (|values| < 2), indicating approximate normality. Table 1 presents the means, standard deviations, and Pearson correlation coefficients for the main variables.

Table 1

Descriptive Statistics and Intercorrelations of the Study Variables (N = 317)

Variable	Mean	SD	1	2	3
1. Childhood maltreatment	43.41	14.12	—		
2. Cognitive flexibility	68.63	15.87	−.52**	—	
3. Entrapment	62.56	5.99	.63**	−.65**	—

Note. **p < .05; *p < .01.*

As shown in Table 1, all variables were significantly correlated in the expected directions: childhood maltreatment was positively associated with entrapment and negatively associated with cognitive flexibility, whereas cognitive flexibility was negatively correlated with entrapment.

Structural Equation Modeling (SEM)

A structural equation model was estimated to test the mediating role of cognitive flexibility in the relationship between childhood maltreatment and entrapment. The measurement model was first confirmed through confirmatory factor analysis (CFA) before testing the structural model. The full mediation model yielded good overall fit indices:

$\chi^2 = 74.7$, df = 45, $\chi^2/df = 1.66$, CFI = 0.98, PGFI = 0.70, Hoelter = 275, RMSEA = 0.04 (90% CI [0.02, 0.06]). These indices indicated an excellent model fit, consistent with established SEM benchmarks (Kline, 2023).

Direct and Indirect Effects

Standardized path coefficients for the hypothesized relationships are summarized in Table 2. Childhood maltreatment had a significant negative direct effect on cognitive flexibility and a significant positive direct effect on entrapment. Cognitive flexibility had a significant negative direct effect on entrapment. The indirect (mediated) effect of childhood maltreatment on entrapment through cognitive flexibility was also significant.

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Table 2

Standardized Path Coefficients and Indirect Effect for the Mediation Model

Path	B	β	SE	t	p
Childhood maltreatment → Cognitive flexibility	−1.11	−0.50	0.16	−7.08	< .001
Cognitive flexibility → Entrapment	−0.21	−0.75	0.03	−7.38	< .001
Childhood maltreatment → Entrapment	0.37	0.58	0.05	7.25	< .001
Indirect effect (CM → CF → EN)	—	**0.24**	—	—	< .05

Note. *CM = Childhood maltreatment; CF = Cognitive flexibility; EN = Entrapment.*

As shown in Table 2, childhood maltreatment had a significant negative direct effect on cognitive flexibility (B = −1.11, β = −0.50, t = −7.08, p < .001), while cognitive flexibility had a significant negative direct effect on entrapment (B = −0.21, β = −0.75, t = −7.38, p < .001). In addition, childhood maltreatment demonstrated a significant positive direct effect on entrapment (B = 0.37, β = 0.58, t = 7.25, p < .001). These findings indicate that cognitive flexibility partially mediates the association between childhood maltreatment and entrapment, suggesting that childhood trauma not only directly intensifies feelings of entrapment but also indirectly contributes to them by reducing individuals' cognitive flexibility.

To evaluate the adequacy of the overall model, several goodness-of-fit indices were examined. The results showed a good model fit: χ^2/df = 1.66, CFI = 0.98, PGFI = 0.70, Hoelter = 275, and RMSEA = 0.04 (90% CI [0.02, 0.06]), all of which fall within the recommended thresholds (χ^2/df < 3, CFI > .90, RMSEA < .08). Among these, RMSEA is particularly reliable as it is less sensitive to sample size. The mediating effect was further confirmed by a bias-corrected bootstrap test with 5,000 resamples, indicating that the 95% confidence interval for the indirect path (β = 0.24, CI [0.16, 0.36]) did not include zero, thereby validating the mediating role of cognitive flexibility.

Model Visualization

To enhance interpretability, Figure 1 illustrates the structural model with standardized coefficients for each path. The figure shows both direct and indirect relationships among childhood maltreatment, cognitive flexibility, and entrapment.

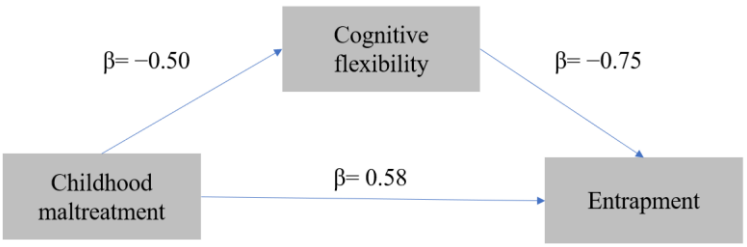

Figure 1

Structural equation model depicting the mediating role of cognitive flexibility in the relationship between childhood maltreatment and entrapment (standardized path coefficients shown).

Discussion and Conclusion

The primary aim of this study was to examine the relationship between childhood maltreatment and entrapment, with cognitive flexibility considered as a mediating factor. The findings revealed that childhood maltreatment significantly predicted higher levels of entrapment, consistent with prior research highlighting the long-term psychological consequences of early adversity (Ion et al., 2023; Krause-Utz et al., 2019). Childhood maltreatment, encompassing emotional, physical, and sexual abuse as well as emotional and physical neglect, has been linked to disrupted emotional regulation, heightened vulnerability to stress, and a

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perceived lack of control—all of which contribute to the subjective experience of entrapment.

Importantly, the present study demonstrated that cognitive flexibility significantly mediates this relationship. This aligns with prior research emphasizing the protective role of cognitive flexibility in mental health (Huang et al., 2024). Cognitive flexibility enables trauma-exposed individuals to reframe painful memories, disengage from rigid thought patterns, and generate adaptive coping strategies. These cognitive capacities are essential for reducing the perception of circumstances as inescapable, which is central to the experience of entrapment (Amédée et al., 2022).

These findings align with and extend the theoretical framework outlined in the introduction, underscoring the importance of identifying protective mechanisms that mitigate the long-term psychological consequences of childhood maltreatment. Although cognitive flexibility emerged as a significant mediator, the partial nature of this mediation suggests that additional factors—such as emotion regulation, resilience, and perceived social support—may also contribute to the pathway linking early adversity to feelings of entrapment. Moreover, contextual and cultural variables, including family dynamics and societal attitudes toward emotional expression, might influence how individuals interpret and respond to maltreatment experiences. Given the cross-sectional design of the present study, causal inferences should be made with caution, as the observed relationships may also reflect bidirectional or reciprocal processes. Longitudinal and experimental designs are needed to clarify the temporal sequence of effects and to determine whether changes in cognitive flexibility precede reductions in entrapment. While the findings highlight cognitive flexibility as a measurable and potentially trainable construct, the implications for intervention should remain tentative until supported by controlled trials. Future studies could explore whether enhancing cognitive flexibility through targeted approaches—such as mindfulness-based training, acceptance and commitment therapy (ACT), or cognitive remediation—can effectively reduce the intensity or frequency of entrapment experiences in trauma-exposed populations.

This study contributes to the growing literature on cognitive mechanisms underlying the psychological impact of childhood maltreatment. By identifying cognitive flexibility as a significant—though partial—mediator between maltreatment and entrapment, the findings suggest that flexible thinking may be associated with lower perceptions of entrapment among adults who experienced early adversity. Individuals with higher cognitive flexibility appear more capable of reframing negative experiences, adapting to stressors, and managing emotional responses, which may help buffer against the development of rigid, hopeless cognitive patterns. These findings provide correlational evidence for the role of cognitive flexibility as a potential resilience factor, rather than demonstrating causal effects. Accordingly, trauma-informed approaches that incorporate strategies to enhance cognitive flexibility warrant further investigation through experimental and longitudinal research.

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Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

The study protocol adhered to the principles outlined in the Declaration of Helsinki, which provides guidelines for ethical research involving human participants. Ethical considerations in this study were that participation was entirely optional.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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Authors' Contributions

All authors equally contribute to this study.

References

Amédée, L. M., Cyr-Desautels, L., Bénard, H., Pascuzzo, K., Dubois-Comtois, K., Hébert, M., Matte-Gagné, C., & Cyr, C. (2022). Cognitive flexibility moderates the association between maltreatment and emotion regulation in residential care children of the middle childhood period. *Developmental Child Welfare*, *4*(3), 217-234. https://doi.org/10.1177/25161032221100233

Başaran, S. K., Gökdağ, C., & Yıldırım, Z. E. (2022). How does cognitive flexibility associate with depressive symptoms? A multiple mediation model including emotion dysregulation and problem-solving. *Yaşam Becerileri Psikoloji Dergisi*, *6*(11), 23-37. https://doi.org/10.31461/ybpd.1110174

Bernstein, D. P., Stein, J. A., Newcomb, M. D., Walker, E., Pogge, D., Ahluvalia, T., Stokes, J., Handelsman, L., Medrano, M., & Desmond, D. (2003). Development and validation of a brief screening version of the Childhood Trauma Questionnaire. *Child abuse & neglect*, *27*(2), 169-190.

Dennis, J. P., & Vander Wal, J. S. (2010). The Cognitive Flexibility Inventory: Instrument development and estimates of reliability and validity. *Cognitive therapy and research*, *34*, 241-253. https://doi.org/10.1007/s10608-009-9276-4

Farahmand, M., & Sharooni, M. (2022). The role of social loneliness, failure and religiosity in ruminating the anger of prisoners. *Social Psychology Research*, *11*(44), 145-164. https://doi.org/10.22034/spr.2022.255632.1586

Gilbert, P., & Allan, S. (1998). The role of defeat and entrapment (arrested flight) in depression: an exploration of an evolutionary view. *Psychological medicine*, *28*(3), 585-598. https://doi.org/10.1017/S0033291798006710

Huang, W., Fang, Y., Tan, X., & Zhao, J. (2024). Childhood trauma, stressful life events, and depression: Exploring the mediating effect of cognitive flexibility. *Psychological trauma: theory, research, practice, and policy*, *16*(S1), S45. https://doi.org/10.1037/tra0001337

Ion, A., Bîlc, M. I., Pițur, S., Pop, C. F., Szentágotai-Tătar, A., & Miu, A. C. (2023). Childhood maltreatment and emotion regulation in everyday life: An experience sampling study. *Scientific Reports*, *13*(1), 7214. https://doi.org/10.1038/s41598-023-34302-9

Kalia, V., Knauft, K., & Hayatbini, N. (2021). Adverse childhood experiences (ACEs) associated with reduced cognitive flexibility in both college and community samples. *Plos one*, *16*(12), e0260822. https://doi.org/10.1371/journal.pone.0260822

Kline, R. B. (2023). *Principles and practice of structural equation modeling*. Guilford Publications.

Krause-Utz, A., Erol, E., Brousianou, A. V., Cackowski, S., Paret, C., Ende, G., & Elzinga, B. (2019). Self-reported impulsivity in women with borderline personality disorder: the role of childhood maltreatment severity and emotion regulation difficulties. *Borderline personality disorder and emotion dysregulation*, *6*(1), 6. https://doi.org/10.1186/s40479-019-0101-8

Li, M., Yuan, Y., Cheng, X., Wang, Y., & Xu, Z. (2024). Childhood maltreatment and insomnia in college students: The role of alexithymia and psychological distress. *Acta psychologica*, *243*, 104149. https://doi.org/10.1016/j.actpsy.2024.104149

Liu, C., Rotaru, K., Lee, R. S., Tiego, J., Suo, C., Yücel, M., & Albertella, L. (2021). Distress-driven impulsivity interacts with cognitive inflexibility to determine addiction-like eating. *Journal of Behavioral Addictions*, *10*(3), 534-539. https://doi.org/10.1556/2006.2021.00027

Sayadi, A., Azarmajd, S., Modaber Chaharborj, F., Salehi, A., Samian, P., & Khanjmali, M. (2024). The Effectiveness of Schema Therapy on Feelings of Frustration and Self-Compassion in Patients with Borderline Personality Disorder. *Medical Journal of Mashhad University of Medical Sciences*, *67*(4). https://doi.org/10.22038/mjms.2024.25130

Yang, J. (2024). Childhood maltreatment, emotion regulation difficulties/externalizing problems, and sleep problems in adolescents: Direct and indirect associations among developmental trajectories. *Sleep medicine*, *115*, 114-121. https://doi.org/10.1016/j.sleep.2024.01.026