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The Relationship between Mentalization and Aggression Mediated by Positive and Negative Affect in Female Students

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Abstract

Introduction: Adolescent girls undergo significant developmental changes during puberty, which can influence aggressive behaviors, impacting their emotional and psychological well-being. This study examines the relationship between mentalization—the ability to understand mental states—and aggression, mediated by positive and negative affect, among female high school students.
Method: Employing a descriptive-correlational design, the research sampled 200 female students from second-level secondary schools in Ahvaz during the 2023-2024 academic year, selected via multi-stage random cluster sampling. Data were collected using the Mentalization Scale, Positive and Negative Affect Scale, and Aggression Questionnaire, and analyzed with Pearson correlation coefficients and Structural Equation Modeling (SEM) using SPSS-24 and Amos-21 software.
Results: Findings indicated a robust model fit, with mentalization significantly predicting increased positive affect and decreased negative affect ($P<0.001$), though it showed no direct effect on aggression. Positive affect negatively influenced aggression, while negative affect positively influenced it ($P<0.001$). Mentalization indirectly reduced aggression through both affect pathways ($P<0.001$).
Conclusion: These findings suggest that mentalization modulates aggression via emotional regulation. Interventions targeting aggression in adolescent girls could focus on enhancing mentalization and fostering skills to regulate positive and negative affect, thereby promoting emotional well-being.

Keywords: Mentalization, Aggression, Positive Affect, Negative Affect, Adolescent Girls

Introduction

The period of adolescence is characterized by rapid physical, cognitive, and emotional maturation, making it a critical phase for mental health and well-being [1]. During this time, adolescents frequently face a range of behavioral and emotional challenges, including externalized issues like aggression, which can have significant negative consequences [2]. While both male and female adolescents experience these vulnerabilities, empirical evidence suggests that adolescent girls may face a greater susceptibility to mental health issues, making the study of aggression within this population particularly important [3, 4].
Aggression is a complex and multifaceted concept influenced by a wide array of situational, psychological, genetic, and emotional factors [5]. Defined as an intentional behavior aimed at causing harm or destruction to others or property, aggression can manifest physically and verbally. It is often associated with negative mental states, cognitive distortions, and maladaptive behaviors. The three main components of aggression are instrumental, affective, and cognitive [6]. Instrumental aggression involves physical and verbal acts, affective aggression is linked to anger and physiological arousal, and cognitive aggression is characterized by hostility and animosity [7]. The pervasive negative outcomes of aggression, both on an individual and societal level, highlight the need for research into its

underlying psychological mechanisms and potential mitigating factors.

One such psychological factor that has been linked to aggression is mentalization [8]. Mentalization refers to the capacity to understand mental states—including feelings, needs, desires, and intentions—in oneself and others [9]. It is a dynamic, semi-conscious process that is sensitive to intense emotions and can be impaired by emotional distress. This capacity is foundational to healthy emotional regulation and social interaction, as it allows individuals to interpret and respond to their own and others' emotions effectively [10]. Research has demonstrated that individuals with a higher capacity for mentalization tend to be better at managing their behavior and forming healthy attachment relationships. Conversely, a deficit in mentalization has been associated with various psychological difficulties, including aggression and impulsivity [8]. Specifically, studies by Parada-Fernandez et al. [11] and Salarhaji et al. [12] found a significant relationship between mentalization and aggression, indicating that fostering this capacity could be a key strategy for reducing aggressive behaviors.

Theoretical frameworks, such as those emphasizing mentalization-based interventions [10], posit that enhanced mentalizing capacity promotes adaptive emotional regulation by facilitating the accurate interpretation of affective states, thereby influencing behavioral outcomes like aggression through pathways of affect modulation [13, 14]. An essential mediating variable that may explain the link between mentalization and aggression is affect, specifically positive and negative affect [15]. Affective experiences are a core component of human personality, and emotional regulation plays a crucial role in character development, social relationships, and self-identity [16]. Positive affect is the tendency to experience positive emotions such as joy, hope, and enthusiasm [17]. It is associated with high energy, focus, and a general sense of well-being, and is positively correlated with various aspects of physical and psychological health [17]. Negative affect, on the other hand, is the inclination to experience negative emotions like stress, anxiety, anger, and hostility. It is linked to feelings of displeasure and disappointment and is strongly associated with the onset and maintenance of psychological disorders [18]. Research indicates a strong and direct relationship between negative affect and aggression, while positive affect has been shown to play a significant role in reducing aggression [19].

Although prior work, including investigations in general youth populations, has begun to explore aspects of affective mediation in aggression-related processes [15, 19], a crucial gap persists in understanding the specific dual mediating roles of positive and negative affect within the mentalization-aggression pathway, particularly among female high school students—a group vulnerable to unique pubertal and socioemotional pressures [3, 4]. Limited research to date has specifically examined the mediating role of both positive and negative affect in the relationship between mentalization and aggression in a sample of female high school students. Given that mentalization is a powerful predictor of emotional regulation and that both positive and negative effects are closely tied to aggression, it is plausible that these affective states act as the underlying mechanisms through which mentalization influences aggressive behavior [13]. Therefore, the present study was conducted to investigate the relationship between mentalization and aggression with the mediation of positive and negative affect in female students.

Method

The current study employed an applied, descriptive-correlational research design. The statistical population included all female high school students in the city of Ahvaz during the 2023-2024 academic year. The sample size of 200 was determined based on the number of variables and free parameters in the structural equation model, adhering to established guidelines for mediation analyses that recommend a minimum of 10–15 participants per estimated parameter to achieve adequate statistical power and model stability. A sample of 200 students was selected using a multi-stage random cluster sampling method to ensure representation from different regions of the city. In the first stage, five geographic clusters (school districts) were randomly selected from the city's 12 districts. In the second stage, two public high schools were randomly chosen from each selected district. In the third stage, one class per grade (10^{th}, 11^{th}, and 12^{th}) was randomly selected from each school, and finally, 5–7 students were randomly sampled from each class to reach the target sample size. The inclusion criteria for participants were being female high school students aged 15–18 years, enrolled in grades 10–12 of public high schools in Ahvaz, and having no prior exposure to psychological interventions. Exclusion criteria included having a diagnosed psychological disorder (as confirmed by self-report and school records to minimize potential confounding effects on emotional regulation and aggression measures) or a history of receiving psychological treatment. All ethical considerations were meticulously observed, including ensuring the anonymity and confidentiality of the participants' data and securing informed consent from both the students and their legal guardians prior to participation.

The tools used in this study were as follows:

Mentalization Scale: Mentalization was measured using the Mentalization Scale (MS) developed by Dimitrijevic et al. [20]. This scale is a self-report instrument consisting of 28 items designed to assess an individual's capacity to understand mental states in themselves and others. The items are rated on a five-point Likert scale, ranging from 1 (completely disagree) to 5 (completely agree). Higher total scores on this scale indicate a greater capacity for mentalization. The total score can range from 28 to 140. The scale has demonstrated good psychometric properties, including strong internal consistency (Cronbach's α=0.82–0.90), test-retest reliability (r=0.75–0.85 over 4 weeks), and construct validity through correlations with related measures of emotional awareness (r=0.40–0.60), and its Persian version has shown high internal consistency [21]. In this study, the Cronbach's alpha coefficient for the MS was calculated to be 0.89.

Positive and Negative Affect Schedule (PANAS): Positive and negative affect were assessed using the Positive and Negative Affect Schedule (PANAS),

developed by Watson et al. [22]. This scale consists of 20 items, with 10 items measuring Positive Affect (PA) and 10 items measuring Negative Affect (NA). Participants rate the extent to which they have felt a particular emotion or mood state over the past week on a five-point Likert scale, from 1 (very slightly or not at all) to 5 (extremely). The PA and NA subscales yield separate scores, ranging from 10 to 50, with higher scores indicating a greater level of that specific affect. The Persian version of PANAS has been widely used and has shown strong reliability [23], with evidence of factorial validity (confirmatory factor analysis supporting the two-factor structure, CFI>0.95), convergent validity (correlations with depression and anxiety scales, r=0.50–0.70), and discriminant validity (low cross-loadings between subscales). The Cronbach's alpha values for the PA and NA subscales in the current study were 0.91 and 0.87, respectively.

Aggression Questionnaire: Aggression was measured using the Aggression Questionnaire (AQ) developed by Buss and Perry [24]. This questionnaire contains 29 items designed to assess various facets of aggression. The items are rated on a five-point Likert scale, ranging from 1 (completely disagree) to 5 (completely agree). The total score can range from 29 to 145, with higher scores indicating a higher level of aggression. The Persian version of this questionnaire has been validated in several studies, showing robust psychometric properties [25], including excellent internal consistency (Cronbach's α = 0.80–0.92 across subscales), test-retest reliability (r=0.70–0.85 over 2 weeks), and construct validity via exploratory and confirmatory factor analyses confirming the four-factor structure (physical, verbal, anger, hostility; loadings>0.40; CFI>0.90), as well as correlations with external aggression measures (r=0.45–0.65). The Cronbach's alpha for the AQ in the present study was found to be 0.93, indicating excellent internal consistency. The collected data were analyzed using statistical software SPSS-24 and Amos-21. The analytical approach included calculating Pearson correlation coefficients to examine the relationships between the study variables, followed by Structural Equation Modeling (SEM) to test the proposed mediation model.

Results

A total of 200 female high school students participated in this study. The age of the participants ranged from 15 to 18 years, with a mean age of 16.5 years (SD=0.9). The participants were enrolled in the 10th (35%), 11th (40%), and 12th (25%) grades in public high schools in the city of Ahvaz.

Table 1 presents the descriptive statistics, including means, standard deviations, skewness, and kurtosis, as well as the Pearson correlation coefficients for the study variables and their relevant subscales (physical, verbal, anger, and hostility subscales for the Aggression Questionnaire). As shown in the table, all variables exhibited skewness and kurtosis values within the acceptable range of ±2, indicating that the data were normally distributed. The correlation analysis revealed that mentalization was negatively correlated with aggression (r=−0.22, P<0.001) and negative affect (r=−0.25, P<0.001), and positively correlated with positive affect (r=0.32, P<0.001). Furthermore, aggression showed a significant negative correlation with positive affect (r=−0.38, P<0.001) and a significant positive correlation with negative affect (r=0.35, P<0.001). These preliminary findings support the hypothesized relationships between the variables in the study's model.

Table 2 shows the results of the final model fit assessment. The data from the SEM analysis indicated that the proposed model provides an excellent fit for the data. The chi-square to degrees of freedom ratio (χ2/df=1.95) was below the recommended threshold of 3.0, and the Root Mean Square Error of Approximation (RMSEA=0.06) was below the recommended value of 0.08, confirming a good fit. Moreover, the Comparative Fit Index (CFI=0.96) and the Normed Fit Index (NFI=0.93) were both above the acceptable threshold of 0.90, further supporting the model's validity. These indices collectively suggest that the proposed theoretical model accurately represents the relationships between the study's variables within the sample population.

Table 1. Descriptive Statistics and Pearson Correlation Coefficients for Research Variables

Variable	Mean	SD	Skewness	Kurtosis	1	2	3	4	5	6	7	9
1. Mentalization	92.45	14.32	-0.45	-0.12	-							
2. Positive affect	31.20	7.85	-0.28	0.15	0.32	-						
3. Negative affect	19.67	6.92	0.56	-0.34	-0.25	-0.42	-					
4. Aggression (total)	68.34	19.45	0.23	-0.09	-0.22	-0.38	0.35	-				
5. Physical Aggression	14.78	5.12	0.41	-0.22	-0.19	-0.31	0.28	0.72	-			
6. Verbal Aggression	16.45	4.89	-0.12	0.08	-0.15	-0.26	0.22	0.65	0.58	-		
7. Anger	17.23	5.67	0.67	0.19	-0.24	-0.35	0.39	0.68	0.52	0.47	-	
8. Hostility	19.88	6.34	0.18	-0.45	-0.21	-0.33	0.31	0.70	0.49	0.54	0.61	-

**: P<0.01

Table 2. Model Fit Indices

Model fit index	Final model value	Recommended value	Result
χ2/df	2.54	< 3.00	Good Fit
RMSEA	0.06	< 0.08	Good Fit
CFI	0.97	0.90	Good Fit
NFI	0.95	0.90	Good Fit
IFI	0.94	0.90	Good Fit

The results of the direct and indirect effects analysis have been presented in Table 3. The structural model revealed that mentalization has a significant direct positive effect on positive affect (β=0.31, P<0.001) and a significant direct negative effect on negative affect (β=−0.28, P<0.001). Positive affect, in turn, has a significant direct negative effect on aggression (β=−0.29, P<0.001), while negative affect has a significant direct positive effect on aggression (β=0.23, P<0.001). Importantly, the analysis showed that the direct effect of mentalization on aggression was not significant (β=−0.11, P=0.140). The mediation analysis, supplemented by the Sobel test for indirect effects, confirmed that mentalization has a significant indirect effect on aggression via both positive affect (β=−0.11, Sobel z=−4.12, P<0.001) and negative affect (β=−0.09, Sobel z=−3.67, P<0.001), thereby supporting the full mediation role of positive and negative affect in this relationship. Figure 1 illustrates the final research model, displaying the significant paths and standardized regression coefficients (β).

Table 3. Direct and Indirect Paths in the Final Model

Path	β	P
Mentalization → Positive affect	0.31	0.001
Mentalization → Negative affect	-0.28	0.001
Mentalization → Aggression	-0.11	0.140
Positive Affect → Aggression	-0.29	0.001
Negative Affect → Aggression	0.23	0.001
Mentalization → Aggression through the mediating role positive affect	-0.11	0.001
Mentalization → Aggression through the mediating role negative affect	-0.09	0.001

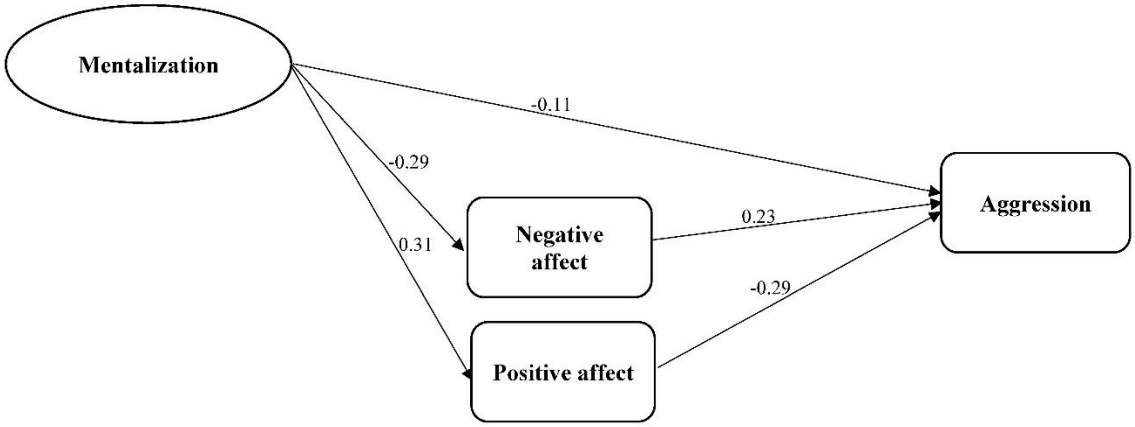

Figure 1. The final research model.

Discussion

The findings of this study confirm the hypothesized full mediation model, wherein mentalization influences aggression indirectly through positive and negative affect among female high school students. This aligns with theoretical models positing mentalization as a proximal regulator of affective processes that, in turn, shape behavioral outcomes [10, 13]. By elucidating these pathways, the results advance prior empirical work on adolescent aggression, particularly highlighting the adaptive role of mentalization in mitigating externalizing behaviors during pubertal transitions [3, 4].

The results indicating a significant positive relationship between mentalization and positive affect, as well as a significant negative relationship with negative affect, are consistent with and build upon a growing body of research. These associations mirror findings from longitudinal studies in young adults, where higher mentalizing capacity prospectively predicts enhanced positive emotionality and reduced negative emotionality via improved metacognitive monitoring of affective cues [13, 14]. In the context of adolescent girls, who often navigate heightened socioemotional demands due to pubertal hormonal fluctuations and relational stressors [3], such mentalization-affect links may buffer against the escalation of internal distress into relational conflicts, fostering resilience in peer and familial interactions. The ability to accurately interpret one's own emotional states allows an individual to manage them more effectively, thereby increasing the experience of positive emotions and mitigating the impact of negative ones. For example, a student with high mentalization skills might be able to recognize feelings of frustration or anger, understand their origin, and choose a constructive response instead of an aggressive outburst. Conversely, a student with low mentalization might be overwhelmed by negative feelings, leading to a maladaptive response [26]. This suggests that enhancing mentalization skills is a foundational step in promoting emotional well-being and reducing the prevalence of negative affect.

Furthermore, the study's findings on the direct relationships between affect and aggression are in line with established psychological theories [27]. The significant negative effect of positive affect on aggression and the significant positive effect of negative affect on aggression confirm that emotional states are powerful predictors of behavioral responses. This is a well-documented relationship in psychological literature; for

instance, a study by Shamsipour et al. [19] found that negative emotions such as anger and hostility are directly linked to increased aggressive behavior, while positive emotions act as a buffer against such behaviors. Our results converge with these, yet diverge slightly from mixed findings in male-dominated samples where positive affect's protective effects were less pronounced [27], potentially underscoring gender-specific emotional processing in girls, who may leverage positive affect more readily for prosocial conflict resolution amid identity formation pressures [4]. Our results echo this, highlighting that when female adolescents experience more positive affect, they are less likely to engage in aggression, and when they experience more negative affect, they are more prone to it. This provides strong support for the importance of fostering positive emotional states and reducing negative ones as a means of aggression prevention.

The most critical finding of this study is the confirmation of the mediating role of positive and negative affect. While previous research has established direct correlations between mentalization and aggression [11, 28], our structural model provides a more nuanced understanding of this relationship, demonstrating that the link is not direct but operates through a dual-pathway mediation. This full mediation pattern extends earlier mediation models focused on single-affect pathways [15, 29], revealing a bidirectional emotional mechanism absent in prior cross-sectional work with broader adolescent cohorts [19]; in female samples, this dual mediation may be amplified by gender-normative emphases on emotional attunement, rendering mentalization a pivotal lever for affect-driven aggression reduction [3]. Mentalization enhances an individual's ability to regulate their emotions, leading to an increase in positive affect and a decrease in negative affect. These shifts in emotional state are the direct causal agents that influence the likelihood of aggressive behavior [29]. This clarifies the "how" behind the mentalization-aggression link and underscores the need for interventions that go beyond simply teaching conflict resolution, instead focusing on the core skill of mentalization and its subsequent impact on emotional regulation.

Limitations of the study include the potential for common method bias arising from self-report assessments, which could inflate associations among variables, and the restricted generalizability due to the focus on female students from public high schools in a single urban Iranian context, limiting applicability to diverse cultural or socioeconomic groups. To address these, future research could incorporate multi-method designs, such as integrating observational measures of aggression or physiological indicators of affect, and employ longitudinal or cross-cultural sampling to establish temporal precedence and broader external validity. Additionally, intervention studies testing mentalization-based training tailored to adolescent girls' developmental needs would further validate these pathways and inform gender-sensitive prevention programs.

Conclusion

The findings of this research clearly demonstrated that both positive and negative affect fully mediate the relationship between mentalization and aggression in female students. Our results suggest that the capacity for mentalization does not have a direct impact on aggression; rather, its influence is indirect, operating through the regulation of emotions. Specifically, higher mentalization leads to an increase in positive affect and a decrease in negative affect, and these affective changes, in turn, modulate aggressive behaviors. This conclusion not only deepens the theoretical understanding of the psychological mechanisms underlying aggression but also has significant practical implications for therapeutic and educational interventions. To effectively and sustainably reduce aggression in adolescent girls, programs should focus on strengthening mentalization and emotional regulation skills.

Conflict of Interest

The authors declare that there is no conflict of interest regarding this article.

Ethical Approval

The study received ethical clearance from the Ethics Review Board at Islamic Azad University, Ahvaz Branch, with approval reference IR.IAU.AHVAZ.REC.1403.346.

Declaration of Generative AI and AI-Assisted Technologies

No generative AI or AI-assisted technologies were used in the preparation of this work.

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