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Modeling the Relationships between Differentiation and Cognitive Emotion Regulation in Mothers with Children's Anxiety: The Mediating Role of Maternal Mental Health

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Abstract

Background: *Children, like adults, experience anxiety when faced with new experiences and different situations. The present study aimed to model the relationships between differentiation and cognitive emotion regulation in mothers with children's anxiety, with the mediating role of maternal mental health.*
Methods: *The research belonged to the category of correlation designs. The target population of the study consisted of all mothers residing in Shiraz in 2019. The sample in the present study consisted of 200 mothers residing in Shiraz. The sample individuals were selected using the cluster sampling method for the research. The instruments used in the present study included the Differentiation of Self Inventory (DSI), the Beck Anxiety Inventory (BAI), Garnefski's Cognitive Emotion Regulation Questionnaire, and the General Health Questionnaire. The obtained results were analyzed using the Amos test.*
Results: *Findings indicated that the differentiation of mothers does not directly impact children's anxiety significantly (P-value=0.0311, β=0.052). However, this factor does have a positive influence on mental health (P-value=0.000, β=0.411). Similarly, the cognitive regulation of mothers can be used to predict children's anxiety. The results from the table demonstrate that mental health has a direct negative effect on children's anxiety (β=-0.298, P-value<0.001). Negative strategies also contribute negatively to mental health (P-value=0.030, β=-0.169) and positively to child anxiety (P-value<0.001, β=0.847). On the other hand, positive strategies do not directly impact child anxiety significantly (P-value=0.916, β=0.01), but they do have a positive and significant effect on mental health (P-value<0.001, β=0.624).*
Conclusions: *The results indicated that differentiation in mothers and positive cognitive emotion regulation strategies lead to improved maternal mental health and reduced anxiety in children. Additionally, differentiation and negative cognitive emotion regulation strategies result in increased anxiety in children and reduced maternal mental health.*

Keywords: Differentiation, Cognitive emotion regulation, Anxiety, Mental health.
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Introduction

Anxiety is the most common psychological disorder in children and can contribute to the development of various other mental illnesses, including psychosomatic illnesses. According to many experts, cultural factors, particularly deprivation and social limitations, are considered to be the main causes of anxiety in children[1]. This disorder can harm thinking, decision-making abilities, perception of the environment, and concentration[2]. A study concluded that there is a significant positive relationship between maternal over-supportiveness and permissiveness with separation anxiety and school phobia[3]. Raeisi et al. (2023) found that the mean scores of mothers of children with psychiatric disorders were higher than the average scores of mothers of children without psychological disorders in the subscales of physical symptoms, anxiety symptoms, social functioning, and depressive symptoms, with a higher difference noted in anxiety symptoms[4].

Differentiation means the degree of an individual's ability to separate behavior from emotions. It is believed that differentiation, based on intrapsychic functioning, refers to the ability to separate emotional processes from cognitive processes, and with self-differentiation, it is the main concept of Bowen's theory that refers to the individual's ability to function independently and allows family members to avoid overemotional interactions[5]. Existing evidence indicates that genetic and environmental factors are involved in the development of anxiety disorders in children. However, contemporary theories emphasize the role of cognitive and emotional processes, such as the mother's cognitive emotion regulation, in the occurrence and persistence of this disorder in children[6]. The construct of differentiation is related to psychological performance. Differentiation has intrapersonal and interpersonal dimensions. Intrapersonal differentiation refers to the ability to distinguish between emotions and cognitive processes[7]. At the interpersonal level, differentiation refers to the ability to be independent while maintaining close relationships with others. Therefore, maternal differentiation may play an undeniable role in the emergence of child anxiety, which will be examined in this study[8].

One of the factors that plays a crucial role in the quality and diversity of human daily experiences is emotions[9]. The way emotions interact and impact other areas, as well as the role of cognitive emotion regulation, is an issue that researchers have focused on concerning disorders such as anxiety. Cognitive emotion regulation refers to how individuals cognitively process events during exposure to unpleasant and stressful situations[10]. According to researchers, individuals use a variety of strategies when faced with stressful conditions. The use of these strategies by mothers can play a role in the

development of disorders in their children[11]. The cognitive emotion regulation of a mother can have a significant impact on how individuals cope with stressful situations. This includes using behavioral and cognitive strategies to change the duration or intensity of an emotional experience[12]. For example, authors concluded in a study that anxiety disorders, such as separation anxiety, will become chronic if left untreated. Given that issues such as symptoms of anxiety disorders are often perceived by parents as a simple part of a child's development stages, they are usually overlooked and require special attention. The performance of parents, especially mothers, can impact the likelihood of anxiety disorders in children. In this context, the role of mothers and their differentiation can have an undeniable impact[13].

Given the role of mothers in children's health, the mental health of mothers can be crucial in the development of children's anxiety. Mental health refers to all methods and measures used to prevent mental illnesses. Psychiatrists consider an individual mentally healthy when there is a balance between their behaviors and control in facing social problems. On the other hand, mental health means the ability to live calmly and be at peace with oneself and others, and mothers with optimal mental health find it easier to tolerate difficult situations and perform better in various areas[14]. In general, it can be said that maternal differentiation and cognitive emotion regulation, as well as maternal mental health, are influential factors in children's anxiety disorders. Since anxiety in childhood can persist into adolescence and adulthood, it can be a risk factor for later years. Based on these explanations, the present study aimed to model the relationships between differentiation and cognitive emotion regulation in mothers with children's anxiety, with the mediating role of maternal mental health. The research model is depicted in figure 1 as follows:

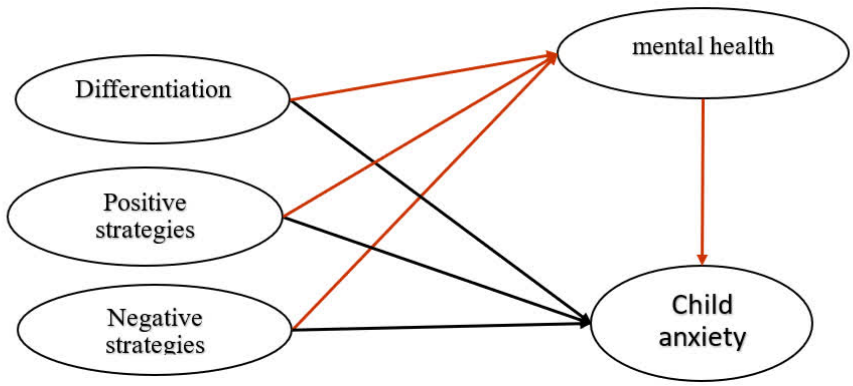

Figure 1. Conceptual framework of the research

Materials and Methods

The present study is focused on correlational designs using structural equation modeling. This type of research shows the causal relationship between variables. The target population consisted of all mothers residing in Shiraz in 2019, and a sample of 200 mothers was selected using the cluster sampling method. Out of all the districts in the city, four were chosen, and 50 individuals were selected from each. Furthermore, the children's questionnaires were completed by their mothers. After obtaining the necessary permissions and coordination, the researcher distributed 200 questionnaires among the sample individuals. Each questionnaire was presented face-to-face to the selected individuals after necessary explanations. Upon distributing the questionnaires, the research objectives were explained, along with instructions on how to complete them, and a reminder regarding the confidentiality of the information was given. Then, the questionnaires were collected after completion, and finally, the data analysis was performed. The collected questionnaires were analyzed using SPSS 20 software at two descriptive and inferential levels. Descriptive statistics such as mean, standard deviation, minimum, and maximum of the research variables were calculated, and at the inferential level, hypothesis testing was conducted using structural equation modeling with Amos20 software.

Differentiation of Self Inventory (DSI): The Differentiation of Self Inventory (DSI) is a 45-item questionnaire developed by Skowron and Friedlander (1998), which includes four subscales of emotional reactivity, 'I' position, emotional cutoff, and fusion with others, and is on a 6-point spectrum (Completely True About Me: score 6, option 5: score 5, option 4: score 4, option 3: score 3, option 2: score 2, Not at All True About Me: score 1)[15]. A higher score on this questionnaire indicates a higher self-differentiation. The 11-item emotional reactivity subscale reflects the degree to which an individual respond to environmental stimuli with excessive sensitivity or emotional variability. The 'I' position subscale consists of 11 items that, along with a clear definition of one's feelings, determine the level of fidelity to personal beliefs when

a person is forced to act against their beliefs. The 12-item emotional cutoff subscale indicates a fear of intimacy and excessive vulnerability in relationships with others. Items related to this subscale indicate fear of intimate relationships and defensive behaviors such as over-functioning, distancing, or denial. Lastly, the 9-item fusion with others subscale reflects engaging in overly emotional relationships with others. Skowron and Friedlander (1998) reported the internal consistency of this questionnaire as follows: emotional reactivity (0.84), fusion with others (0.74), 'I' position (0.83), emotional cutoff (0.82), and total score (0.88)[15]. In Iran, Cronbach's alpha was reported as 0.81 for emotional reactivity, 0.79 for fusion with others, 0.64 for 'I' position, 0.76 for emotional cutoff, and 0.72 for the total score[16].

Beck Anxiety Inventory (BAI): The Beck Anxiety Inventory (BAI) was developed by Aaron T. Beck to provide an instrument that can validly distinguish between depression and anxiety. This instrument can be useful for research and clinical purposes and may possess a specific advantage over other self-assessment tools that have not been able to adequately differentiate between anxiety and depression[17]. The scale consists of 21 items, each describing a common anxiety symptom. Participants are asked to indicate the extent to which each symptom is present based on a 4-point scale ranging from 0 to 3 (not at all=0, mildly=1, moderately=2, severely=3), with the scores for the items being summed together. The total score ranges from 0 to 63. In a study conducted by Kaviani and Mousavi (2008), the validity and reliability of the Beck Anxiety Inventory were assessed in Iranian patient and non-patient populations. A total of 1513 men and women from various age and gender groups in Tehran were randomly invited to participate in the study and completed the BAI test. In addition, 261 anxiety patients attending clinics and treatment centers were invited to the study using cluster sampling. The results of the research indicated that the Beck Anxiety Inventory in the Iranian population demonstrated validity (r=0.72), reliability (r=0.83), and internal consistency (α=0.92)[18].

Cognitive Emotion Regulation Questionnaire (CERQ): The Cognitive Emotion Regulation Questionnaire was developed by Garnefski et al.[19]. This questionnaire is a multidimensional self-report tool consisting of 36 items and has distinct forms for adults and children. The scale assesses nine cognitive emotion regulation strategies, including self-denial, reception, rumination, positive rebound, focus on planning, positive reassessment, visibility, disaster, and blaming others. Garnefski et al. have reported good reliability and validity for this questionnaire. The questionnaire includes 36 five-point items (ranging from never to always), assessing four items for each of the nine factors. Overall, this questionnaire provides an opportunity to explore the relationships between the use of cognitive coping strategies with other personality variables, psychological pathology, and other issues. This questionnaire can be administered to normative and clinical groups aged 12 and above[19]. Samani and Sadeghi (2010) examined the psychometric properties of the Cognitive Emotion Regulation Questionnaire in a research study. The results of the alpha coefficient (ranging from 0.71 to 0.81) and the test-retest reliability for the subscales of CERQ indicated an appropriate reliability of this questionnaire[20].

General Health Questionnaire (GHQ): For assessing mental health, the General Health Questionnaire was used. This questionnaire was first developed by Goldberg in 1972. The original form of this questionnaire consists of 60 items, and short forms with 12 to 28 items have also been prepared and translated into 38 languages, with psychometric studies conducted in 70 countries worldwide[21]. This questionnaire assesses an individual's symptoms from one month before to the time of the test execution (self-assessment). Psychometric studies of various versions of the General Health Questionnaire show that the 28-item version has the highest reliability, sensitivity, and specificity compared to other versions. The 28-item includes four subscales of somatic symptoms, anxiety, social dysfunction, and depression. Sometimes, a binary scale (0 and 1) is used for scoring in this questionnaire, but the most common scoring method is the Likert scale[21]. In this research, the Likert system (four-point scoring) is used for scoring, where each of the four options is assigned a score (3, 2, 1, 0). Therefore, the score range for each participant is variable from 0 to 84. A higher score on this test indicates a more severe impairment in general health .In Iran reliability analysis showed satisfactory result (Cronbach's alpha coefficient=0.87)[22].

Results

Initially, the analyst examined the descriptive data of the research factors. The participants were categorized into three age groups: 25-35 years (21%), 35-40 years (49%), and over 40 years (30%). Similarly, the participants were classified based on their level of education into four groups: Undergraduate, Bachelor's degree, Master's degree, and Doctorate. Table 2 shows the mean and standard deviation of the research variables.

Based on the information provided in Table 3, it is evident that the positive strategies variable showed a strong positive correlation with differentiating yourself (P-value<0.01; r=0.812). Conversely, negative strategies displayed a significant negative correlation with differentiating yourself (P-value<0.01; r=-0.750). Additionally, mental health exhibited a notable positive relationship with differentiating yourself (P-value<0.01; r=0.643), while child anxiety demonstrated a considerable negative association with differentiating yourself (P-value<0.01; r=-0.616).

Before delving into the conceptual model of the study, the researcher first examined the assumptions of the structural equation model. It was found that there were some missing data within the dataset, which were then substituted with the mean values of the variables under study. Notably, there were no outliers detected in any of the research variables. To assess the normal distribution of variables in the current study, the researcher utilized skewness and kurtosis indices. The values of these indices falling within the range of -3 to +3 indicate a normal distribution of the research variables. Here, the skewness and kurtosis values for the research variables were within the acceptable range, confirming the normal distribution of all variables.

In terms of the path coefficient, which is also known as the standardized beta in regression, values below 0.3 are considered to be insignificant, between 0.3 and 0.6 as moderate, and 0.6 and above as strong. The researcher in this study selected a bootstrap value of 1000.

According to the data in Table 4 and Figure 2, it is evident that the differentiation of mothers does not directly impact children's anxiety significantly (P-value=0.311, β=0.052). However, this factor does have a positive influence on mental health (P-value=0.000, β=0.411). Similarly, the cognitive regulation of mothers can be used to predict children's anxiety. The results from the table demonstrate that mental health has a direct negative effect on children's anxiety (β=-0.298, P-value<0.001). Negative strategies also contribute negatively to mental health (P-value=0.030, β=-0.169) and positively to child anxiety (P-value<0.001, β=0.847). On the other hand, positive strategies do not directly impact child anxiety significantly (P-value=0.916, β=0.001), but they do have a positive and significant effect on mental health (P-value<0.001, β=0.624). The indirect coefficients and bootstrap test results in the table demonstrate that the indirect influence of mothers' differentiation and cognitive regulation on mental health is significant (P-value<0.05). Essentially, when mothers use positive emotion regulation strategies and exhibit higher mental health, children's anxiety decreases, while the use of negative emotion regulation strategies and reduced mental health in mothers leads to an increase in child anxiety. The researcher also employed the Sobel Test to evaluate the importance of the mediating variable in the study, and this calculation was based on a specific formula-value=a×b/SQRT(b2×sa2 + a2×sb2)

If the Z value in the Sobel test exceeds 1.96, it indicates that the mediating effect of a variable is statistically significant at the 95% confidence level. The correlation between standing out with mental health and child anxiety was found to have a Z value of -2.9515. The Sobel test results suggest that the mediator variable in the research holds importance. For the relationship between positive strategies through mental health and child anxiety, the Z value was found to be -3.80268. It can be inferred from the Sobel test results that the mediating variable plays a significant role in this relationship. The Z value for the association between negative strategies through mental health and child anxiety was 2.01296. The Sobel test results suggest that the mediating variable is significant in this particular relationship.

Table 1. Description of the demographic variables

Variables	Groups	Frequency	Percent
Age	25-35	42	21
	35-40	98	49
	Over 40	60	30
Education	Undergraduate	102	51
	Bachelor's degree	56	28
	Master's degree	32	16
	Doctorate	10	5

Table 2. Descriptive statistics of the variables

Variables	Mean±SD	Min	Max
Differentiate yourself	131.45±15.85	43	209
Positive strategies	54.4±8.78	16	74
Negative strategies	67.73±6.96	20	98
Mental health	37.51±8.43	15	79
Child anxiety	32.14±9.15	16	63

Table 3. Pearson's Correlations

Variable	Method	1	2	3	4	5
Differentiate yourself	Pearson's r	—				
Positive strategies	Pearson's r	0.812**	—			
Negative strategies	Pearson's r	-0.750**	-0.795**	—		
Mental health	Pearson's r	0.643**	0.831**	-0.763**	—	
Child anxiety	Pearson's r	-0.616**	-0.767**	0.613**	-0.739**	—

** P<0.01

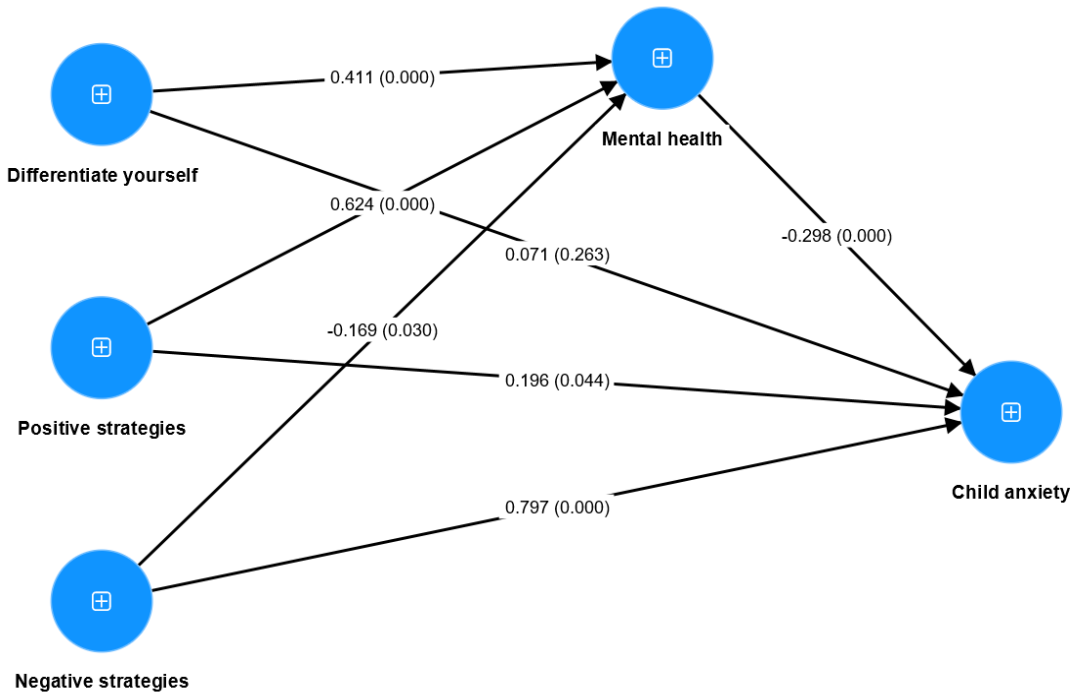

Figure 2. Path coefficients between variables and significance level

Table 4. Model path coefficients and model significance

Paths	Total effects				Result
	Estimate	P-value	STDEV	T statistics	
Differentiate yourself -> Child anxiety	-0.052	0.311	0.051	1.013	rejection
Differentiate yourself -> Mental health	0.411	0.000	0.113	3.640	confirmation
Mental health -> Child anxiety	-0.298	0.000	0.059	5.081	confirmation
Negative strategies -> Child anxiety	0.847	0.000	0.043	19.727	confirmation
Negative strategies -> Mental health	-0.169	0.030	0.077	2.176	confirmation
Positive strategies -> Child anxiety	0.010	0.916	0.098	0.105	rejection
Positive strategies -> Mental health	0.624	0.000	0.108	5.785	confirmation
Paths	**Indirect effects**				**Result**
	Estimate	**P-value**	**STDEV**	**T statistics**	
Positive strategies -> Mental health -> Child anxiety	**-0.186**	**0.001**	**0.053**	**3.486**	confirmation
Differentiate yourself -> Mental health -> Child anxiety	-0.122	0.003	0.041	2.982	confirmation
Negative strategies -> Mental health -> Child anxiety	0.050	0.030	0.023	2.174	confirmation

Discussion

This study aimed to investigate the mediating role of maternal mental health in the relationship between maternal differentiation and cognitive emotion regulation with children's anxiety. The results regarding the mediating role of maternal mental health in the relationships between maternal differentiation and cognitive emotion regulation with children's anxiety showed that the indirect effect of maternal differentiation and cognitive emotion regulation on the path of maternal mental health is significant. These results are consistent with the studies of Zali et al.[23], Smith et al.[24], Bashi Abdolabadi et al.[25], and Shahnazdoust et al.[26]. In explaining this finding, it can be said that Bowen demonstrates differentiation on a hypothetical continuum, where on one side, there is differentiation, and on the other side, there is fusion with others. Fusion-prone individuals strongly need the validation and support of others, and their behaviors are influenced by the emotional system of the environment and the reactions of others[15].

Individuals with differentiation have a clear definition of themselves and their beliefs, and they can choose their path in life, not lose control, and make decisions based on reason and logic in highly emotional situations that lead to irrational behaviors and inappropriate decisions for many individuals[27]. In contrast, undifferentiated individuals who do not have a

defined identity and move along with the emotional tide of their family in roles and interpersonal issues, experience high levels of chronic anxiety and are vulnerable to psychological problems and the emergence of symptoms of diseases[5].

Moreover, the term differentiation refers more to a process through which a person can gradually achieve independence and healthy dependence and free themselves from chronic anxiety and unnecessary suffering[25]. The level of differentiation of each individual is best observed in stressful family situations and the extent to which a person can control their behavior by explicit and thoughtful principles despite severe anxiety within the family. Differentiated individuals quickly escape stressful events. They can tolerate chronic anxiety or separate from it, but undifferentiated individuals seem to function well when experiencing low levels of stress, while they are prone to mental malfunctions[7].

The anxiety in undifferentiated individuals arises from decision-making processes that are based on the need to maintain relationships rather than logical processes. They make their main decisions based on avoiding conflicts, but differentiated individuals can make rational decisions without emotional dominance. Therefore, it can be observed that differentiation can affect experienced anxiety in mothers. This means that the higher the differentiation of mothers, the better they can separate their emotions from their children and distinguish between child-rearing and autonomy[28].

In other words, the level of maternal differentiation allows them to strive for individual independence growth in their children, and if the source of anxiety could be considered as fear of separation and vulnerability, maternal differentiation can determine the level of this anxiety. On the other hand, maternal differentiation can directly impact the mental health of mothers. In a way that with the growth of differentiation, anxiety and depression decrease, social functioning improves, and social relationships are controlled. Based on this principle, it seems that the common factor between differentiation and mental health is managed interpersonal relationships that can reduce child anxiety[25,26].

The study has some limitations. If questionnaires are the only measurement instruments, they can have many limitations. The limitation related to population and sampling and the lack of other groups of participants restricts the ability to compare and generalize results. Examining the independent or mediating role of other influential variables in children's anxiety, such as mothers' problem-solving styles or children's attachment, is a recommendation of this study. Conducting experimental designs, such as the impact of emotion regulation-based therapy training for mothers on children's anxiety, is another suggestion of this research.

In this study, the results related to the mediating role of maternal mental health in the relationship between mothers' differentiation and cognitive emotion regulation with children's anxiety showed that the indirect effect of mothers' differentiation and cognitive emotion regulation on the path of mental health is significant. Therefore, using educational programs that can help mothers develop their differentiation skills and also improve cognitive emotional regulation can enhance maternal mental health and ultimately reduce their children's anxiety.

Ethical Considerations

The ethical guidelines were followed, and the ethical code was obtained from Payame Noor University IR.PNU.REC.1401.132.

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Conflict of Interest

The authors confirmed that there were no competing interests present.

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