



Research paper

## Prediction of Anger Rumination and Expression Based on Behavioral Inhibition and Activation Systems with Mediation of Difficulty in Emotion Regulation

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### Abstract

The study was aimed to investigate the relationship between the behavioral inhibition and activation systems and anger rumination and expression with the mediation of difficulty in emotion regulation. This was descriptive correlational research. The study population included all students aged 18 to 22 years studying in Tehran's public universities, and 384 people were selected with use of convenience sampling method, and responded to the Behavioral Inhibition System/Behavioral Activation Scale, Anger Rumination Scale, Anger Expression Scale, and Brief Version of Difficulties in Emotion Regulation Scale. The data were analyzed through path analysis with the hierarchical regression method and Sobel test. The results showed that the behavioral inhibition systems and the behavioral activation system predicted anger rumination and expression through difficulty in regulating emotions. The findings have practical implications for preventive and therapeutic interventions in anger management.

**Keywords:** Anger expression/ rumination, behavioral activation system, behavioral inhibition system, difficulty in emotion regulation

### Introduction

Anger is an emotional response to a perceived threat that appears in various forms such as anger rumination or anger expression. Anger rumination and expression are common among young people that cause the emergence and continuation of other disorders and have numerous negative consequences for the individual and society (Khoshfetrat, et al., 2022) such as threaten physical and mental well-being, hinder the adaptive performance within family and academic and professional situations and cause hostile relationships are replaced by peaceful and supportive ones (Ariyazangane, et al., 2022). Considering that the emotion of anger is the result of various internal and external factors, knowing and better understanding how these factors influence as possible causes of occurrence or exacerbation of anger rumination and expression and mental illnesses, can be used and helps in the design of psychological interventions at different levels to improve performance in managing the emotion of anger. Since the difficulty in emotion regulation affects the way people deal with their emotions, it can play a role in various forms of psychopathology (Dragan, 2020). Therefore, the present study aims to test these hypotheses: 1. Difficulty in emotion regulation plays a mediating role in the relationship between behavioral inhibition system and anger rumination. 2. Difficulty in emotion regulation plays a mediating role in the relationship between behavioral activation system and anger expression.

## Method

The research method was descriptive correlational design. The statistical population was made up of all students aged 18 to 22 years studying in Tehran's public universities in 2023. A sample of 384 people were selected, using the convenience sampling method and responded to research tools. The tools were sent anonymously through links in virtual social networks to maintain the confidentiality and reliability of the data. Data were analyzed using hierarchical regression was used by Baron & Kenny method in SPSS26 software and Sobel test.

## Tools

**The Behavioral Inhibition System/Behavioral Activation Scale (BAS/BIS):** This 20 items scale was created by Carver and white (1994), has 2 subscales, the Behavioral Inhibition System and Behavioral Activation System, scored on a 4-option Likert scale. Its Cronbach's alpha coefficient reported between 0.66 and 0.74. The criterion validity of this scale was between 0.23 and 0.42. Cronbach's alpha of the scale was between 0.72 and 0.80 in this research.

**Brief Version of Difficulties in Emotion Regulation Scale (DERS-16):** This 16 items scale was created by Bjureberg, et al. (2016), scored on a 5-option Likert scale. Its Cronbach's alpha coefficient reported 0.92. The construct validity of this scale was 0.80. Cronbach's alpha of the scale was 0.82 in this research.

**Anger Rumination Scale (ARS):** This 10 items scale was created by Sukhodolsky, et al. (2001), scored on a 4-option Likert scale. Its Cronbach's alpha coefficient reported between 0.72 and 0.86. The construct validity of this scale was confirmed through factor analysis. Cronbach's alpha of the scale was 0.86 in this research.

**Anger expression Scale (AES):** This 7 items scale was created by Buss & Perry (1992), scored on a 5-option Likert scale. Its Cronbach's alpha coefficient reported 0.83. The construct validity of this scale was confirmed through factor analysis. Cronbach's alpha of the scale was 0.88 in this research.

## Results

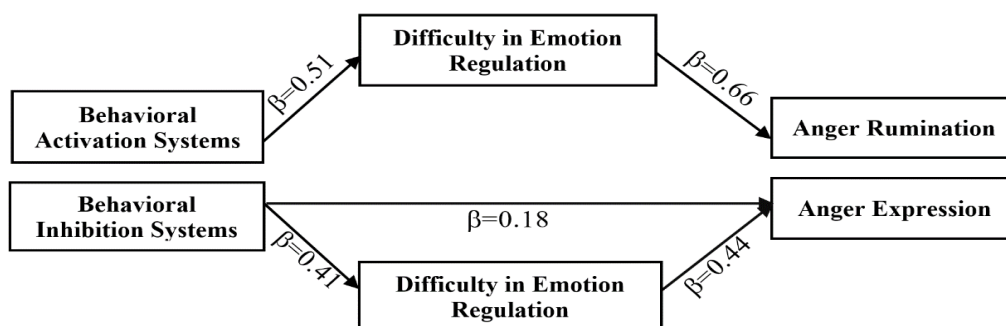
The assumptions of normality by the skewness and kurtosis, independence of errors by Durbin-Watson, linear multiplicity by tolerance and variance inflation factors were checked and maintained.

**Table 1. Results of Regression analysis of hypothesized mediation model for predicting anger rumination/ expression**

	<b>R</b>	<b>R<sup>2</sup></b>	<b>F</b>	<b>B</b>	<b>b</b>	<b>SE</b>	<b>t</b>	<b>Bootstrap 95% CI</b>
<b>Step 1</b>								
<b>Behavioral inhibition system</b>	0.37	0.14	62.66	0.51**	0.37	0.06	7.91	0.67 – 0.35
<b>Step 2</b>								
<b>Behavioral inhibition system</b>	0.68	0.47	76.09	0.05	0.04	0.05	0.93	0.21 – -0.07
<b>Difficulty in emotion regulation</b>				0.44**	0.66	0.02	15.24	0.48 – 0.38
<b>Step 1</b>								

<b>Behavioral activation system</b>	0.36	0.13	55.45	0.34**	0.36	0.04	7.44	0.43 – 0.24
<b>Step 2</b>								
<b>Behavioral activation system</b>	0.53	0.28	76.09	0.17**	0.18	0.04	3.77	0.25 – 0.09
<b>Difficulty in emotion regulation</b>				0.30**	0.44	0.03	9.20	0.35 – 0.24

Table 1 shows that the beta coefficient predicting anger rumination by the behavioral inhibition system is positive and significant ( $P < 0.001$ ,  $b = 0.37$ ). Thus, the behavioral inhibition system is a positive and significant predictor of anger rumination. The predictive power of the behavioral inhibition system compared to when it entered the regression equation alone, was not significant ( $b = 0.04$ ). It means that mediation has occurred completely in the relationship between the present variables. The results of the Sobel test ( $z = 5.54$ ) also confirmed the mediating effect of difficulty in emotion regulation. Also, the beta coefficient predicting anger expression by the behavioral activation system is positive and significant ( $P < 0.001$ ,  $b = 0.36$ ). Thus, the behavioral activation system is a positive and significant predictor of anger expression. The predictive power of the behavioral activation system compared to when it entered the regression equation alone, decreased ( $b = 0.18$ ). It means that mediation has occurred in the relationship between the present variables. The results of the Sobel test ( $z = 6.34$ ) also confirmed the mediating effect of difficulty in emotion regulation.



**Figure 1. Validated mediation model for predicting anger expression/ rumination**

## Discussion and Conclusion

The results showed that the behavioral inhibition systems, directly and indirectly, and the behavioral activation system, indirectly through difficulty in regulating emotions, can predict anger rumination and expression. Thus, emerging adults' awareness of how to regulate emotions helps them to be equipped with emotion management capabilities and thereby reduces the effect of high activity levels of behavioral inhibition and activation systems on anger expression/ rumination. With this decrease, the difficulty in emotion regulation also decreases, which in turn can lead to a decrease in anger expression/ rumination and vulnerability to internal and external disturbances. The findings are useful for understanding the complex mechanism of the relationship between the behavioral inhibition and activation system with anger rumination and expression, and have practical implications for preventive and therapeutic interventions in anger management. One of the research limitations was that the difficulty in emotion regulation was considered in general. Therefore, it is suggested to use tools that measure various types of difficulty in emotion regulation in future research in

investigating the relationship between behavioral inhibition and activation systems and psychopathology. Also, the statistical population included people aged 18 to 22, and this limits the generalization of the findings to people who are at the end of this age range. Therefore, it is suggested that future research should include all age ranges of young people.

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## Conflict of Interests

The author declared no conflict of interest.



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