

# Study of the Mediation Role of Acceptance and Mindfulness in Relation between Behavioral Inhibition/Activation System Sensitivity and Emotional Distress

Rozna Asgharnezhad<sup>1</sup>, Reza Abdi<sup>2</sup>

<sup>1</sup>M. A. in Clinical Psychology, Faculty of Humanities and Education, Department of Psychology, Islamic Azad University, Tabriz Branch, <sup>2</sup>Department of Psychology, Azarbaijan Shahid Madani University, Tabriz, Iran

## Abstract

**Context:** Emotional disturbances are caused by various factors that include two general biological and cognitive components. Understanding the factors affecting emotional disturbances is important in improving the quality of life of individuals. **Aims:** This study was aimed to determine the mediation role of acceptance and mindfulness in relation between behavioral inhibition/activation system sensitivity and emotional distress of Islamic Azad University, Tabriz branch. **Settings and Design:** The research method of the study was descriptive form type of correlational. **Subjects and Methods:** The statistical population of the study included all students of the Islamic Azad University, Tabriz branch. Among them, 380 participants (190 females and 190 males) were selected through cluster random sampling. To collect the data, Carver and White's (1994) behavioral inhibition and behavioral activation scales, Bond *et al.*'s (2007) second version of the Acceptance and Action Questionnaire-II, and Bauer *et al.*'s (2006) five-facet mindfulness questionnaire and depression, anxiety, and stress scale, were used. **Statistical Analysis Used:** To analyze the data, the Pearson correlation coefficient and multiple regression were used. **Results:** The findings indicated that behavioral inhibition/activation systems, acceptance, and mindfulness could significantly predict about 45% of depression variance, 53% of anxiety variance, and 41% of stress variance of emotional distress. **Conclusions:** According to the findings, it could be concluded that stress, anxiety, and depression as emotional distress are the result of the behavioral inhibition/activation systems that they are the result of the acceptance and mindfulness effect. In fact, the acceptance and mindfulness have the mediation role in relation between behavioral inhibition/activation system sensitivity and emotional distress. In order to regulate emotions, it should be pay attention to behavioral inhibition/activation systems, acceptance, and mindfulness.

**Keywords:** Acceptance, anxiety, behavioral activation/inhibition systems, depression, mindfulness, stress

## INTRODUCTION

Emotional, anxiety, and mood disorders are known as common, chronic, and costly disorders which compromise the qualities and functions of a healthy life and cause issues in the lives of millions of people worldwide.<sup>[1,2]</sup>

Psychological pathology of emotional distress could be addressed from different aspects. One of the theories which address the psychological pathology of the emotional disorders and distresses from biological and natural points of view focus on two biological motivation systems. These two biological systems are assumed to adjust convergent, divergent, and preventive behaviors in response to the stimuli. These two systems, i.e., behavioral inhibition and behavioral activation systems, increase the activating and convergent behaviors

as well as feelings of excitement and hope. On the contrary, behavioral inhibition system is activated when facing signs of punishment and lack of rewards and new stimuli to create responses associated with behavioral inhibition and prevention as well as creating the feelings of anxiety and excitement. Researches show that excessive activity of the inhibition system leads to personal characteristics such as anxiety, high sensitivity to threatening stimuli, and behaviors associated with anxiety.<sup>[3]</sup>

**Address for correspondence:** Dr. Reza Abdi,  
Department of Psychology, Azarbaijan Shahid Madani University,  
Tabriz, Iran.  
E-mail: r.abdi@azaruniv.a.c.ir

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Gray, quoting Beauchaine,<sup>[4]</sup> considers the brain/behavioral systems to be the basis for personal differences and the activity of each of them leads to recalling different emotional reactions. Gray proposes three emotional systems. Behavioral activation system which is associated with positive affection and is characterized by positive behavioral tendencies, extraversion, and impulsivity. The behavioral inhibition system is characterized by behavioral tendencies of fear and inertia such as introversion, depression, and anxiety. Numerous studies have shown that the relationship between inhibition system and negative affections.<sup>[5]</sup>

Since emotion regulation is an important part of any person's life, it is not surprising that emotional distress and regulation could lead to mental illness.<sup>[6]</sup> Depression which is known to be one of the main health threats in the 21<sup>st</sup> century is the most important reason for emotional distress during a lifetime.<sup>[7]</sup>

Another psychological phenomenon, which could provide the opportunity for understanding the emotional distresses, is the concept of mindfulness. This construct is a form of meditation which is rooted in the eastern religious beliefs, particularly Buddhism, which is integrated into psychological treatments in different forms.<sup>[8,9]</sup> For the first time, Linehan<sup>[10]</sup> emphasized the necessity of mindfulness as one of the main components of psychological treatments. Kabat-Zinn<sup>[11]</sup> has defined mindfulness as paying attention to particular methods on an objective at the present time without judgment and prejudice. Mindfulness required the development of three qualities including avoiding judgment, intentional awareness and focusing on the present. Focused attention on the present leads to the processing of all aspects of immediate experience, i.e., cognitive, physiological, or behavioral activities. Due to the practices and techniques based on mindfulness, one could become aware of their daily activities, autonomous function of their mind in the past and the present, and take the control of their thoughts, emotions, and physical conditions by having momentary awareness of them and become free of daily and autonomous mind focused on the past and the present.<sup>[12,13]</sup> In mindfulness, one becomes aware of their mental gear at any moment, and after this awareness, they learn to shift their mind from one method to another method based on two mental methods, i.e., doing and being. However, this requires teaching special behavioral, cognitive, and metacognitive strategies for focusing of the attention process.<sup>[13]</sup>

These studies have shown that various clear relationships exist between mindfulness and the issues related to the emotion regulations. First, relative overlaps exist between the conceptual definitions of these two phenomena and second, both concepts entail awareness (supervision or review) and accepting the emotional responses.<sup>[14,15]</sup> Acceptance and mindfulness are inversely related to psychological distress in which emotion regulation, rumination, and nonattachment have an intermediary role.<sup>[16]</sup> Hayes and Feldman<sup>[17]</sup> describe methods which could improve emotion regulation abilities by increasing the overinvolvement (e.g., rumination and confusion) and

decreasing the involvement with emotions (e.g., avoidance) and thereby facilitating the healthy and adaptive engagement which develops the functional and clear usage of emotional responses. Numerous evidence reflects a negative significant relationship between different aspects of mindfulness (acting with awareness, nonjudging, and nonreacting) with the anxiety and depression syndromes.<sup>[18-21]</sup>

Although many of the anxieties and mood disorders occur as a response to stressors and are characterized by emotional responses, little attention is paid to the role of behavioral inhibition system in emotional reactions to cognitive stressors. Behavioral inhibition theories suggest that this natural variable should be related to some negative outcomes including a high degree of emotional reactivity and inefficient regulation methods.<sup>[22]</sup> A study on children with ages 12–14 showed that children with high levels of behavioral inhibition are reported to have higher anxiety, distress, and depression compared to other children.<sup>[23]</sup> Ly and Gomez<sup>[24]</sup> showed that both forms of anxieties have a positive relationship with the sensitivity to punishment and behavioral inhibition system, but a negative relationship with the behavioral activation system by investigating the relationship between brain-behavioral systems and social interaction. The results of the study by Vervoort *et al.*<sup>[25]</sup> verified the assumption that clinical anxiety is related to the overactivity of behavioral activation system. In this study, the behavioral inhibition system scores of the group with anxiety were higher compared to that of the nonanxious group. Pourmohammadreza Tajrishi and Mirzamani Bafghi<sup>[26]</sup> carried out a research on the relationship between the activities of brain-behavioral systems, social support, and depression and showed that a significant relationship exists between the activity level of the behavioral inhibition system and depression. Soltan Mohammadlou *et al.*<sup>[27]</sup> pointed out that behavioral inhibition variables, emotion regulation difficulties, and metacognition have a positive significant relationship with anxiety.

Accordingly, the objective of the current research is to seek solutions to the question of whether the acceptance and mindfulness have a mediation role between the behavioral inhibition/activation system sensitivities and emotional distress.

## SUBJECTS AND METHODS

Regarding fundamental objective and approach, the current study is a descriptive correlational type. The students of the Islamic Azad University of Tabriz form the statistical population of this study. The sample size is approximated to be a total of 380 students (190 males and 190 females) using the Krejcie–Morgan table and cluster sampling method. The following tools were used for the collection of the data.

### The scale of behavioral inhibition/activation systems

This questionnaire was created by Carver and White, in 1994, and addresses the two behavioral inhibition and activation systems. This scale consists of 20 questions including two general factors inhibition (seven questions) and activation (13 questions)

systems. In this form, the behavioral activation factor consists of three subscales, i.e., reward responsiveness, drive, and fun seeking. Using Cronbach's alpha, the reliability of this scale is reported to be 0.74 for the inhibition scale, and for other activation subscales, i.e., reward responsiveness, drive, and fun seeking, values 0.73, 0.76, and 0.66 are reported, respectively.<sup>[28]</sup> In Iran, Atri Fard<sup>[29]</sup> has reported the reliability of the behavioral inhibition system to be 0.47, and the values for other behavioral activation subscales, i.e., reward responsiveness, drive, and fun seeking to be 0.73, 0.60, and 0.78, respectively.

### Acceptance and Action Questionnaire-II edition

This questionnaire was created by Bond *et al.*<sup>[30]</sup> and was translated to Farsi by Abasi *et al.*<sup>[31]</sup> This questionnaire consists of ten articles. This questionnaire assesses a construct which addresses diversity, acceptance, experiential avoidance, and psychological flexibility. Higher scores reflect higher psychological flexibility. Using Cronbach's alpha, the reliability of this scale was obtained to be 0.84, and the retest reliability in 3- and 12-month periods was obtained to be 0.81 and 0.79, respectively.<sup>[30]</sup> In Iran, Abasi *et al.*<sup>[31]</sup> used explorative factor analysis to identify two factors called avoiding emotional experiences and life control. The reliability of this scale was obtained to be 0.89 using Cronbach's alpha.

### Five-Facet Mindfulness Questionnaire

This questionnaire was created by Baer *et al.*<sup>[32]</sup> This questionnaire is a tool which is obtained based on explorative factor analysis. The analysis results have identified a five-facet model, which evaluate the different aspects of mindfulness. These factors include observation, description, conscious action, not judging internal experience, and not reacting to internal experiences. These factors are measured by a 39-item self-reporting questionnaire. Five-facet scales have high internal consistencies (0.75–0.90).<sup>[32]</sup> In Iran, the reliability of this questionnaire was calculated to be 0.84 by Babapour and Ahmadi<sup>[33]</sup> using an internal consistency method and Cronbach's alpha.

### Depression, Anxiety, and Stress Scales-21 items

The depression, anxiety, and stress scales-21 (DASS-21) scale is a set of three self-assessment subscales which are designed for the measurement of negative emotional conditions such as depression, anxiety, and stress.<sup>[34]</sup> Each of three DASS-21 subscales consists of seven articles. In Iran, this scale was validated by Sahebi *et al.*<sup>[35]</sup> They obtained the internal consistency of this scale to be 0.77, 0.79, and 0.78 for depression, anxiety, and stress scales, respectively, using Cronbach's alpha. The validity of this test was calculated using explorative factor analysis. The results showed that this test has three factors. The first factor (stress) predicts 17.25% of the total variance and the second (depression), and third (anxiety) factors predict 15.09% and 14.32% of the total variance, respectively.

### Implementation method

For the implementation of the current study, after obtaining the necessary coordination and permissions for the collection of the required data, the questionnaires were distributed arbitrarily

among the students in the faculties of the Islamic Azad University of Tabriz. To encourage the participants to cooperate, the objective of the research was explained to them before the distribution and filling out the questionnaires, and confidence building was carried out regarding the confidentiality of the research to answer the questionnaire honestly while having informed participation. The collected data were statistically analyzed using SPSS software, version 20, IBM company, Armonk, NY, United States of America. In the descriptive section, statistical indices, including quantity, mean, and standard deviation, were used. In the inferential part, Pearson's correlation coefficients matrix and multiple regressions were used for the analysis of the research hypotheses.

## RESULTS

In this part, descriptive statistics including mean and standard deviation and variables correlation matrix will be initially presented. Then, descriptive statistics and hypothesis testing are performed. Table 1 presents the mean, standard deviation, and correlation matrix of the studied variables.

As presented in Table 1, no significant relationship exists between acceptance and emotional distress components (depression, anxiety, and stress). A negative significant relationship exists between mindfulness and emotional distress components (depression, anxiety, and stress) ( $P < 0.001$ ). No significant relationship exists between behavioral activation systems and emotional distress components (depression and stress). However, a negative significant relationship exists between behavioral activation systems and emotional distress component (anxiety) ( $P < 0.001$ ). Finally, a positive significant relationship exists between behavioral inhibition systems and emotional distress components (depression, anxiety, and stress) ( $P < 0.001$ ).

To examine the mediation role of acceptance and mindfulness relationship between behavioral inhibition/activation system sensitivity and emotional distress using the structural equation modeling. The result is shown in Figure 1.

Table 2 shows the original name of the applied variables in the above model.

In Figure 1, standardized coefficients of the model have been showed to study the mediation role of acceptance and mindfulness in relation between behavioral inhibition/activation system sensitivity and emotional distress. The goodness of fit has been summarized in Table 3.

As it shown in Table 3, all the goodness of fit indices is in the acceptable domain and approved the model. Therefore, it can be said that the acceptance and mindfulness in relation between behavioral inhibition/activation system sensitivity and emotional distress have the mediation role.

## DISCUSSION

The objective of the current research was to examine the mediation role of acceptance and mindfulness in relation

**Table 1: Mean, standard deviation, and Pearson correlation coefficient matrix**

	Mean	SD	1	2	3	4	5	6	7
1. Acceptance	47.51	7.63	1						
2. Mindfulness	124.86	13.16	-0.07	1					
3. Behavioral activation	40.78	6.04	-0.06	0.2**	1				
4. Behavioral inhibition	13.15	4.94	-0.01	-0.25**	0.03	1			
5. Depression	21.64	9.85	0.02	-0.27**	-0.08	0.71**	1		
6. Anxiety	16.65	9.4	0.01	-0.045**	-0.19**	0.69**	0.74**	1	
7. Stress	23.67	8.74	0.09	-0.31**	-0.02	0.64**	0.75**	0.73**	1

\*\*Is significant at the 0.001 level. SD: Standard deviation

**Table 2: Name of the applied variables**

Applied variable in model	Original name
BAS	Behavioral Activation System
BIS	Behavioral Inhibition System
Mindfulness	Mindfulness
Pazireshoamal	Acceptance
DASS	Emotional distress
Depression	Depression
Anxiety	Anxiety
Stress	Stress

DASS: Depression Anxiety, and Stress Scales

**Table 3: The goodness of fit indices**

Fit index	$\chi^2/df$	GFI	RFI	RMSEA	NFI
Acceptable domain	$\leq 3$	>0.9	>0.9	<0.08	>0.9
Observed domain	2.24	0.96	0.92	0.065	0.95

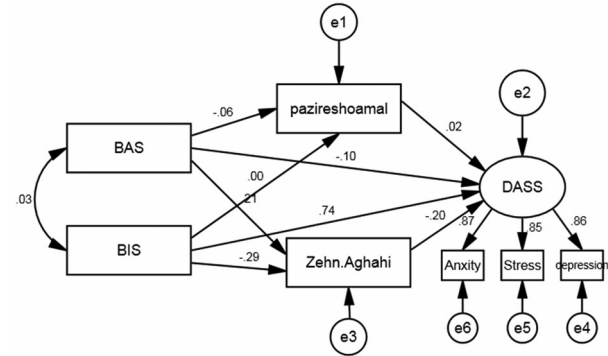
GFI: Goodness of fit index, RFI: Relative fit index, NFI: Normed fit index, RMSEA: Root mean square error of approximation

between behavioral inhibition/activation system sensitivity and emotional distress of the students. According to the findings, it could be concluded that stress, anxiety, and depression as emotional distress are the result of the behavioral inhibition/activation systems that they are the result of the acceptance and mindfulness effect. In fact, the acceptance and mindfulness have the mediation role in relation between behavioral inhibition/activation system sensitivity and emotional distress.

The findings of the current research are in line with the results of the previous researches.<sup>[15,18,21,36-46]</sup>

The studies show that using mindfulness techniques could lead to learning more effective methods for emotion regulation similar to fully experiencing emotions without trying to control them.<sup>[47]</sup> Mindfulness could also facilitate the transferring of a person from emotional dysregulation into using adaptive regulation strategies though decreasing the avoidances and over involvements.<sup>[48]</sup>

Those with low reported levels of mindfulness have higher tendency to helplessness and lower mental health. Higher levels of self-assessment are associated with overinvolvement or noninvolvement such as experiential avoidance, thought



**Figure 1:** The scanning electron microscope for study the mediation role of acceptance and mindfulness in relation between behavioral inhibition/activation system sensitivity and emotional distress

suppression, rumination (contemplation), and a higher level of emotional intelligence.<sup>[49]</sup>

It can be said that the mind consciousness can create positive changes in happiness and well-being through the combination of vitality and the clear observation of experiences. The studies imply that stress reduction program based on mind consciousness is effective in improving the mental, physical, emotional, and moral well-being as well as high quality of life, enjoying the life, and low stress and physical symptoms.<sup>[50]</sup>

Leen-Feldner *et al.*<sup>[22]</sup> showed that children with high behavioral inhibition are reported to have higher distress, anxiety, and depression levels.

Based on reinforcement sensitivity theory, the anxiety function refers to two behavioral inhibition mechanisms. First, oversensitivity in some areas, except for septohippocampal system increases the inherent destructive hatred input and leads to anxiety. Second, increased overactivity of the septohippocampal system or overactivity of amygdala which is connected to this system leads to excessive increase in the threatening evaluations of environmental stimuli which in turn leads to risk evaluations and increased negatives evaluations of situations.<sup>[51]</sup>

Experiential avoidance could act as a connecting thread between mindfulness and emotion regulation. In general, avoidance is an inconsistency emotion regulation method. However, as pointed out before, mindfulness is an immediate experience accepting all thoughts, emotions, and physical senses without

judgment and prejudice about them. Hence, one could consider mindfulness to be against avoidance and overinvolvement strategies (e.g., rumination and anxiety).<sup>[17]</sup> Mindfulness could facilitate intentional self-regulation and emotion regulation.<sup>[17]</sup> Furthermore, nonjudgmental awareness (as a part of mindfulness) could facilitate healthy engagement with emotions<sup>[17]</sup> and let one to encounter their emotions and emotion tools in their real and original form.<sup>[52]</sup>

## CONCLUSIONS

The findings one could point out that an individual with behavioral inhibition system finds the possible future threatening events as a vague stimulus and this leads to increased fear and anxiety as well as the appearance of preventive behaviors in them. On the other hand, due to the issues associated with flaws in emotion regulation including accepting anxiety and unclear emotions, one is unable to control them and show proper behaviors and increases their ineffective and preventive behaviors. However, given the relationship between mindfulness and emotional distress and the relationship between mindfulness and behavioral activation system and behavioral inhibition system, the obtained results were expected.

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## Conflicts of interest

There are no conflicts of interest.

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