



## Reward-Seeking Behaviors and Behavioral Activation Therapy in Depressed Individuals

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### Dear Editor-in-Chief

Anhedonia, the reduced anticipation of pleasurable stimuli and limited responsiveness to reward, is one of the main symptoms of major depressive disorder in the in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition DSM-5 (1). Anhedonia contributes to reward-processing deficits in depression.

Deficit in hedonic processing is affect in depressed individuals' motivation to engage in potentially rewarding experiences (2). Individuals with depression have lowered behavioral activation (BA) Reward-Responsiveness and Drive, which may impair functioning in goal pursuit (3). Lowered BA may result in a decreased advantageous response bias, and this diminished responsiveness to reinforcement may lead to decreased drive towards, learning of, and engagement in pleasurable activities and rewards (4). Rewards are experienced as creating better things. Therefore, they are liked, wanted and pursued. Thus, utilization of rewards produces hedonic aftermaths which start learning processes that fortify liking the rewarding goal, learning cues that predict its availability and actions that permit it using up, and allocating value and motivational positions to the reward so that organism can select among numerous behavioral options and deter-

mine what level of resources to put toward obtaining a specific goal. Based on reinforcement-learning models, assumed that an animal will act to maximize future rewards. According to this theory, the brain estimates and keeps in memory the value of possible action, the likely resulting rewards or punishments (5).

The researchers also began to study individuals' basis of neuroscience in having or avoiding motivation. One of these studies (6) is Davidson's the approach and withdrawal systems. This model had two separate systems of motivation and emotion and presents approach system and withdrawal system. Approach system is hypothesized to control target and reward-based behaviors and in response to incentives and rewards and other positive stimuli. As the organism has a great motivation for a pleasurable goal, the approach system considered organism as the responsible of producing particular positive emotions. This system suggested that abnormalities in the facing system play an etiological role in depression and depression is considered a defect in facing motivation, and therefore depressed people are considered as being less responsive to rewards. In support of this theory, dysphoric students and



those with major depression respond less to rewards compared to the control group (6). Thus, low trait reward-responsiveness and high trait behavioral inhibition predicted reduced reward-seeking behavior in individuals with depression and lowered BA may result in a decreased advantageous response bias. In addition, based on the cognitive behavioral approach and according to the model of Ferster (7), depression is a chain of loss, reduction or lack of rewards and inability to obtain rewards. In behavioral models, depression is considered by the type of relationship between the individual and the environment; in other words, depression is caused by the failure to achieve reinforcements or the lack of dependence between individual behaviors and reinforcements. Therefore, considering that depressed people have deficiency in reward seeking behaviors and tend to avoidance behaviors, the purpose of this study was to improve the seeking rewards in depressed individuals by using behavioral activation therapy (7,8).

The present study was an experimental study with pretest-posttest and follow-up with control group. The research statistical population was Tabriz University students in the academic year of 2019-2020. Sample population was considered 60 based on the research method and the drop in it, so 30 individuals as intervention group and 30 persons as control group was enrolled randomly. After ethical approval by the Ethics Committee of University of Tabriz (IR.UTBZ.REC.1158.176), manner of implementation of this study was explained to participants. Participants after being informed of aims of study provided signed informed consent. To collect the data, Beck Depression Inventory (BDI-II), the BIS / BAS Carver and White questionnaires were used. Table 1 shows that behavioral activation in post-test and follow-up stages was effective and the statistical power of 0.1 indicates an acceptable statistical accuracy.

**Table 1:** Results of the covariance analysis test

Scale	Stages	Variable index	df	F	P-Value	Effectiveness	Statistical power
Total	Post-test	Pre-test	1	345.8	0.01	0.61	1
		intervention	1	50.7	0.01	0.70	1
	Follow-up	Pre-test	1	16.04	0.01	0.43	1
		intervention	1	34.8	0.01	0.62	1

Overall, the results of this study showed that BAT was effective in improving the reward seeking behaviors in depressed individuals. Since BA will increase the positive reinforcement and the gaining reward from the patient. It facilitates the achievement of positive reinforcement, which can be effective in improving the learning of, and engagement in pleasurable activities and rewards.

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### Conflict of interest

The authors declare that there is no conflict of interest.

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