



Mindfulness and acceptance in relation to Behavioral Inhibition System sensitivity and psychological distress



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ARTICLE INFO

Article history:

Received 8 February 2014
Received in revised form 31 July 2014
Accepted 7 August 2014
Available online 14 September 2014

Keywords:

Behavioral Inhibition System
Mindfulness
Acceptance
Psychological distress
Emotion regulation

ABSTRACT

The current study examined whether two adaptive emotion regulation strategies, mindfulness and acceptance, moderate the relationship between Behavioral Inhibition System sensitivity and psychological distress. Participants were 467 students at a large Midwestern university. Data were collected with paper-and-pencil questionnaires and analyzed using hierarchical multiple regression analyses. A significant positive association was observed between Behavioral Inhibition System sensitivity and psychological distress, with acceptance and mindfulness facets (Nonreactivity and Observing) significantly moderating this association. Findings suggest mindfulness- and acceptance-based strategies may buffer the influence of Behavioral Inhibition System sensitivity on the development and maintenance of psychological distress in nonclinical populations.

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1. Introduction

Research on the relationship between emotion regulation (ER), temperamental vulnerabilities (e.g., Behavioral Inhibition System [BIS] sensitivity), and symptoms of psychopathology has focused on maladaptive ER strategies (e.g., Pickett, Bardeen, & Orcutt, 2011). However, the influence of adaptive ER strategies may be equally important. Adaptive ER strategies such as mindfulness and acceptance may reduce negative affect associated with psychological symptoms by modifying an individual's response to heightened emotional reactivity associated with BIS sensitivity. The current study examined mindfulness and acceptance as potential moderators in the relationship between BIS sensitivity and psychological distress.

1.1. BIS and psychological distress

The revised Reinforcement Sensitivity Theory (rRST; Corr, 2008; Gray & McNaughton, 2000) posits that three interconnected

motivational systems impact individual differences in temperament and emotional responding; BIS balances activation of the Behavioral Activation System (BAS) toward rewarding stimuli with activation of the Fight–Flight–Freeze System (FFFS) toward threatening stimuli and perceived punishment. Conflict between BAS and FFFS activates BIS and produces anxiety and arousal, possibly inhibiting behavioral responses and reducing personal risk. Anxiety and arousal levels depend on the degree of conflict between systems or BIS sensitivity. Increased BIS sensitivity may cause greater anxiety and arousal and increase avoidant behaviors.

Increased BIS sensitivity has been linked to psychopathology, specifically anxiety and depressive disorders including generalized anxiety disorder (Maack, Tull, & Gratz, 2012), social anxiety disorder (Kimbrel, Nelson-Gray, & Mitchell, 2012), posttraumatic stress disorder symptoms (Pickett et al., 2011), and major depression symptoms and depressive moods (Pinto-Meza et al., 2006). Heightened BIS sensitivity may increase feelings of anxiety and fear resulting in an increase in avoidance motivations, driving maladaptive ER while adaptive ER, such as mindfulness and acceptance, may reduce these experiences (Gratz & Tull, 2010).

1.2. Mindfulness and acceptance

Mindfulness and acceptance focus on maintaining active awareness of present events and feelings while remaining non-judgmental and nonreactive (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006). Engaging in mindful and accepting behaviors may enhance psychological flexibility (Hayes, Luoma, Bond,

Abbreviations: AAQ-II, Acceptance and Avoidance Questionnaire-II; ACT, acceptance and commitment therapy; BAS, Behavioral Activation System; BIS, Behavioral Inhibition System; DASS, Depression Anxiety and Stress Scales; ER, emotion regulation; FFMQ, Five Facet Mindfulness Questionnaire; FFFFS, Fight–Flight–Freeze System; MBCT, mindfulness-based cognitive therapy; MBSR, mindfulness-based stress reduction; rRST, revised Reinforcement Sensitivity Theory.

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Masuda, & Lillis, 2006). Coupled with increased awareness and insight, greater psychological flexibility allows individuals to direct behaviors toward increasing long-term life quality (Hayes, Wilson, Gifford, Follette, & Strosahl, 1996; Hayes et al., 2006). Therefore, mindfulness and acceptance may reduce the emotional reactivity associated with BIS sensitivity and increase positive emotional experience.

Research has examined the efficacy of mindfulness- and acceptance-based treatment programs (see Baer, 2003; Kabat-Zinn, 1990; Segal, Williams, & Teasdale, 2002; and Hayes, Strosahl, & Wilson, 1999), in reducing BIS-related psychological distress. These programs include mindfulness exercises (e.g., breathing and meditative exercises) that may increase acceptance of unwanted emotions and experiences, resulting in behavioral changes that decrease distress (Forman, Herbert, Moitra, Yeomans, & Geller, 2007). Specifically, mindfulness-based stress reduction (MBSR) decreases levels of anxiety, depression, and stress from pre- to post-treatment (Goldin & Gross, 2010; Kabat-Zinn et al., 1992; Marchand, 2012) and promotes long-term maintenance of reductions (Miller, Flietcher, & Kabat-Zinn, 1995). Decreased psychological distress is an outcome associated mindfulness-based cognitive therapy (MBCT; e.g., Marchand, 2012) and acceptance and commitment therapy (ACT; e.g., Forman et al., 2012). Researchers suggest that behavioral activation fosters mindfulness and counteracts increased behavioral inhibition associated with psychopathology (Evans et al., 2008).

1.3. BIS, mindfulness, and acceptance

Limited research has investigated mindfulness and acceptance related to BIS sensitivity and psychological distress. Recently, mindfulness and well-being were negatively related to BIS sensitivity and mindfulness was positively related to well-being (Sauer, Walach, & Kohls, 2011). BIS sensitivity mediated the relationship between mindfulness and well-being (Sauer et al., 2011). Further, lower BIS-sensitivity and higher mindfulness and well-being were observed for meditation practitioners compared to non-practitioners. An interpretation of the results focused on using mindfulness to reduce BIS sensitivity; however, this assumption was not directly examined. This interpretation may be problematic because BIS sensitivity may be a stable trait minimally influenced by the environment (Takahashi et al., 2007). A model accounting for the moderating role of emotion regulation may improve our understanding of the relationship between BIS sensitivity and psychological distress. If BIS sensitivity is stable, ER strategies may moderate the associated emotional outcomes instead of merely explaining the relationship (Bijttebier, Beck, Claes, & Vandereycken, 2009). However, the influence of mindfulness and acceptance on BIS sensitivity and the relationship between BIS sensitivity and psychological outcomes has not been investigated. Therefore, the aim of the current study was to examine the relationship between BIS sensitivity, mindfulness and acceptance, and psychological distress.

1.4. Aims and hypotheses

The current study examined the influence of mindfulness and acceptance on the relationship between BIS sensitivity and psychological distress. Since BIS sensitivity is associated with negative psychological outcomes (e.g., Maack et al., 2012), it was first hypothesized that BIS sensitivity would be positively associated with psychological distress. Consistent with previous research (Marchand, 2012), it was also hypothesized that mindfulness and acceptance would be negatively associated with BIS sensitivity and psychological distress. Further, the stable nature of BIS sensitivity (Takahashi et al., 2007) contradicts the proposition that BIS sensitivity mediates the relationship between mindfulness and

well-being. Therefore, it was hypothesized that mindfulness and acceptance would instead moderate the association between BIS sensitivity and psychological distress. Such findings would suggest that mindfulness and acceptance buffer the negative effects of BIS sensitivity associated with psychological distress.

2. Methods and materials

2.1. Participants

Data were collected from 467 college students (77.3% Female) who received partial research credit at a large Midwestern university. Most participants identified as White (78.6%), and others identified as Black/African American (11.2%), Asian (3.2%), American Indian Alaska Native, Native Hawaiian or other Pacific Islander (0.6%), and Other (6.4%). Additionally, 2.9% identified their ethnicity as Hispanic or Latino. Item responses were missing for 20% of the cases. Maximum-likelihood estimation was used to account for the subsequent missing subscale scores (1.6% of the total data were replaced).

2.2. Procedure

Participants were recruited from the psychology department subject pool. Data were collected in sessions of 18 or less participants. After the informed consent process, participants completed a series of paper-and-pencil questionnaires. Upon completion, participants were debriefed and granted research credit. Participation requirements were fluency in English and a minimum age of 18 years.

2.3. Measures

2.3.1. Covariates

Sex, age, and race were evaluated as covariates in the analyses. Sex was dummy coded as Sex (% Female) = Male (0) and Female (1). Race was dummy coded as two variables, Race (% White) = White (1) and not White (0) and Race (% Black) = Black (1) and not Black (0).

2.3.2. BIS/BAS scale

The BIS/BAS Scales (Carver & White, 1994) were used to assess BIS and BAS sensitivity. Participants rated 20 items on a 4-point Likert scale (1 = very true for me, 4 = very false for me). A total score was calculated by summing the BIS sensitivity items. Sum scores were also calculated for each of the BAS subscales (i.e., Reward Responsiveness, Fun Seeking, and Drive). The BIS/BAS Scales have adequate psychometric properties (Carver & White, 1994). Internal consistencies (i.e., alpha coefficients) for the BIS/BAS Scales were sufficient and are presented in Table 1.

2.3.3. Acceptance and Action Questionnaire-II

The Acceptance and Action Questionnaire-II (AAQ-II; Bond et al., 2011), a 7-item self-report measure of psychological flexibility, was used to assess acceptance to experiencing negatively perceived private events (i.e., cognitions, memories). Participants rated each item on a 7-point Likert scale (1 = never true, 7 = always true). Responses were reversed scored and summed for a total score of Acceptance. The AAQ-II demonstrated adequate psychometric properties across seven samples ($n = 3280$; Bond et al., 2011). Internal consistency (i.e., alpha coefficient) was excellent for the AAQ-II and is presented in Table 1.

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