



Experiential avoidance as a moderator of the relationship between behavioral inhibition system sensitivity and posttraumatic stress symptoms

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ARTICLE INFO

Article history:

Received 16 February 2011

Received in revised form 28 June 2011

Accepted 29 June 2011

Keywords:

Behavioral inhibition sensitivity

Behavioral activation sensitivity

Experiential avoidance

Posttraumatic stress disorder

Trauma

ABSTRACT

Preliminary evidence suggests that high emotional reactivity, in conjunction with maladaptive self-regulatory processes, increases one's vulnerability to develop psychopathology. In the present study, associations between behavioral inhibition system (BIS) and behavioral activation system (BAS) sensitivity, experiential avoidance (EA) and trauma-related outcomes (i.e., posttraumatic stress symptoms [PTSS]) were examined in a sample ($N = 851$) of female college students who had experienced at least one traumatic event. Positive associations were observed between BIS sensitivity, EA, and PTSS. In addition, EA moderated the relationship between BIS sensitivity and PTSS, with participants high in BIS sensitivity and high in EA reporting significantly more PTSS than participants high in BIS sensitivity and low in EA. No association was observed between BIS sensitivity and PTSS for participants low in EA. These findings suggest that an unwillingness to experience unwanted private events, in conjunction with increased BIS sensitivity, contributes to PTSS severity. Further, there was a positive association and a negative association found between PTSS and BAS-Drive and BAS-Reward Responsiveness, respectively. A marginally significant EA \times BAS-Fun Seeking interaction was also observed. Present findings suggests the importance of pursuing an etiological model of posttraumatic stress disorder in which neurobiological factors (i.e., BIS/BAS sensitivity) and self-regulatory processes (i.e., EA) interact to produce psychopathology.

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1. Introduction

Evidence suggests that experiential avoidance (EA) is associated with posttraumatic stress symptoms (PTSS) following trauma (Marx & Sloan, 2005; Orcutt, Pickett, & Pope, 2005) and additional evidence suggests that EA may play an etiological role in the development of posttraumatic stress disorder (PTSD; Plumb, Orsillo, & Luterek, 2004). PTSD is a disorder that develops subsequent to a traumatic event and is characterized by distressing recollections of the traumatic event, exaggerated bodily responses, avoidance of trauma reminders, and decreased emotional reactivity (American Psychiatric Association [APA], 2000). Given that an estimated 70% of civilians will experience a traumatic event over the course of a year (Breslau, Davis, Andreski, & Peterson, 1991; Kilpatrick, Saunders, Best, & Von, 1987; Resnick, Kilpatrick, Dansky, Saunders, & Best, 1993) and approximately 18–25% of these individuals will subse-

quently develop PTSD (Breslau et al., 1991; Resnick et al., 1993), it is important to further understand the role of EA in the development of PTSD. Recent conceptualizations suggest examining the contexts in which engaging in self-regulatory processes, such as EA, may increase the risk for psychopathology (see e.g., Bijttebier, Beck, Claes, & Vandereycken, 2009). Therefore, in the current study we investigated sensitivity of the behavioral inhibition and behavioral activation systems (BIS and BAS, respectively) in relation to both EA and PTSS in a sample of college women reporting at least one traumatic event.

Experiential avoidance has been conceptualized as a functional class of maladaptive strategies aimed at reducing the occurrence of unwanted private events, such as thoughts, emotions, memories or bodily sensations (Hayes, Wilson, Gifford, Follette, & Strosahl, 1996). There is abundant research supporting the proposition that rigid and inflexible use of EA strategies may lead to a wide variety of negative outcomes (for a review see e.g., Chawla & Ostafin, 2007). Of specific relevance to the current paper are the associations that have been observed between EA and anxiety-related difficulties (Kashdan, Barrios, Forsyth, & Steger, 2006), including the development of PTSS and PTSD (Boeschen, Koss, Figueredo, & Coan, 2001; Marx & Sloan, 2005; Orcutt et al., 2005; Orsillo & Batten, 2005). Although the use of EA strategies has been described as a natural

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developmental process (Hayes et al., 1996; Hayes, Barnes-Holmes, & Roche, 2001), understanding contexts in which these strategies are enacted may provide important information regarding the association between EA and negative outcomes (e.g., mood, anxiety, and substance use disorders), and may aid in the development of techniques to prevent such outcomes. Further, the Reinforcement Sensitivity Theory (RST; Corr, 2004; Gray & McNaughton, 2000) may provide insight into the neurobiological subsystems involved in this process.

1.1. Reinforcement sensitivity theory

The RST posits that individual differences observed in personality, emotional reactivity, psychopathology, and motivation for reinforcement are mediated by neurobiological subsystems (Corr, 2004). The current RST conceptualization recognizes three subsystems (i.e., BAS, BIS, Fight-Flight-Freeze system [FFFS]; Gray & McNaughton, 2000). The BAS is responsible for appetitive behaviors motivated by rewarding stimuli (Corr, 2004; Gray & McNaughton, 2000), while the FFFS is responsible for avoidance and/or escape behaviors motivated by fearful or threatening stimuli (Corr, 2004; Gray & McNaughton, 2000). While the BAS is theorized to underlie positive motivational behaviors and positive emotional states, the emotion primarily associated with the FFFS is fear (Corr, 2004; Gray & McNaughton, 2000). The BIS is thought to be responsible for mediating approach behaviors of the BAS and escape/avoidance behaviors of the FFFS when there is a conflict between these two systems (Corr, 2004; Gray & McNaughton, 2000). The BIS may simultaneously inhibit behavior and search the environment and other brain systems (e.g., memory) for a balance between reinforcement of reward and punishment (Corr, 2004). Attempts to resolve these conflicts may result in anxiety reactions (Corr, 2004; Gray & McNaughton, 2000). Strength of an anxiety reaction is thought to be determined by (a) the extent to which the BAS and FFFS are in conflict and (b) the degree of BIS sensitivity associated with motivational conflict. Therefore, a high degree of conflict and higher BIS sensitivity would be expected to result in heightened anxiety (Corr, 2004). Although the revised RST posits that the FFFS and BIS are separate systems, the separate systems theory has not been strongly supported with psychometric data (Heym, Ferguson, & Lawrence, 2008; Tull, Gratz, Lutzman, Kimbrel, & Lejuez, 2010; Vervoort et al., 2010). The most commonly used measures of BIS/BAS sensitivity (such as the BIS/BAS Scales used here; Carver & White, 1994) are derived from the original RST theory, in which the FFFS and the BIS were represented as one construct (i.e., BIS). Using the Carver and White (1994) measure, efforts to identify two factors (i.e., 3-item FFFS and 4-item BIS scales) representing the separate systems have been minimally successful (Heym et al., 2008; Vervoort et al., 2010). Specifically, only one study has supported a two factor solution with acceptable psychometric data; however, the sample was of questionable size given the analytic strategy conducted (Heym et al., 2008). Other studies have not found acceptable psychometric support for a two factor model (Tull et al., 2010; Vervoort et al., 2010), including the current study. Given that an unacceptable internal consistency for the 3-item FFFS scale was observed in the current sample (Cronbach's $\alpha = .47$) and previous research has supported use of Carver and White's (1994) BIS scale as a measure of combined BIS and FFFS sensitivity (Corr, 2004; Smillie, Pickering, & Jackson, 2006), any subsequent reference to the BIS scale will be made assuming the combined measurement of BIS and FFFS sensitivity.

1.1.1. RST and psychopathology

The various iterations of the RST have implicated both the BIS and BAS in the development of psychopathology (Corr, 2004; Gray & McNaughton, 2000). The theoretical assumptions for the BIS and BAS have been empirically supported in relation to anxiety, mood,

eating and substance-related disorders and have been associated with emotion regulation difficulties noted in personality disorders (see Bijttebier et al., 2009 for a review). Of specific relevance to the current study, the relationship between BIS sensitivity and anxiety symptoms has evidenced strong empirical support; whereas the relationship between BAS sensitivity and anxiety symptoms is less clear. Specifically, higher BIS sensitivity has been shown to be related to higher general anxiety symptoms (Beevers & Meyer, 2002; Campbell-Sills, Liverant, & Brown, 2004; Johnson, Turner, & Iwata, 2003; Jorm et al., 1999; Kimbrel, Nelson-Gray, & Mitchell, 2007), social anxiety disorder (Coplan, Wilson, Frohlick, & Zelenski, 2006) and obsessive-compulsive disorder (Fullana et al., 2004a,b). As for the limited evidence suggesting an association between BAS sensitivity and anxiety symptoms, it appears that lower BAS sensitivity may be related to a severe form of generalized social anxiety and related to a specific dimension of social anxiety labeled social interaction anxiety (Kashdan, 2002; Kimbrel, Mitchell, & Nelson-Gray, 2010). With regard to trauma-related pathology, to our knowledge, there has been no research examining the relation of the BIS or BAS to PTSS or PTSD.

1.1.2. RST and self-regulatory mechanisms

Recently, researchers have begun to examine mechanisms accounting for the relationship between various dimensions of personality and the development of psychopathology. Bijttebier et al. (2009) highlight the importance of explaining the personality/psychopathology association instead of repeatedly reporting the correlations between the two. Although there is strong evidence to suggest specific patterns of association between personality and problematic outcomes, there are also significant variations that need further investigation. Specifically, a mental health diagnosis has been observed to account for only 10% of the variance associated with temperamental vulnerability (i.e., BIS/BAS; Johnson et al., 2003), which supports the examination of intervening mechanisms. Self-regulatory processes, which would broadly include EA strategies (see e.g., Kashdan et al., 2006a), have been suggested as intervening mechanisms (i.e., mediators or moderators) of the relationship between temperament dispositions and the development of psychopathology (Aldao, Nolen-Hoeksema, & Schweizer, 2010).

There is evidence to suggest that self-regulatory mechanisms may contribute to development of psychopathological reactions, especially within the context of a personality dimension associated with strong emotional reactivity (see Bijttebier et al., 2009, for a review). Specifically, high emotional reactivity in conjunction with maladaptive self-regulatory processes increases one's vulnerability to develop psychopathology (e.g., Calkins & Fox, 2002; Lonigan & Phillips, 2001). Therefore, it would be important to investigate self-regulatory mechanisms as mediating or moderating factors in this relationship. To date, only one study has investigated the relationship between BIS and BAS sensitivity and self-regulatory mechanisms (i.e., emotion regulation difficulties). Tull et al. (2010) observed a positive relationship between self-reported BIS sensitivity and emotion regulation difficulties; whereas BAS sensitivity findings were less clear. BAS-Fun Seeking (i.e., seeking new rewards or approaching potential rewards hastily) was positively associated with self-reported emotion regulation difficulties and BAS-Reward Responsiveness (i.e., experience of positive emotion from rewards or expectation of rewards) was negatively associated with self-reported emotion regulation difficulties (Tull et al., 2010). These findings are an important first step in understanding the relationship between BIS and BAS sensitivity and problematic self-regulatory mechanisms; however, there are no published studies examining the interaction of BIS and BAS sensitivity and self-regulatory mechanisms in relation to psychopathological outcomes. The current study addresses this gap in the literature.

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