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The examination of behavior inhibition system sensitivity, experiential avoidance, and sex in relation to post-traumatic stress symptom severity: Comparison of a moderated versus mediated model

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ABSTRACT

Research has shown that women are more likely to develop PTSD subsequent to trauma exposure in comparison with men. Additionally, women are more likely to report maladaptive emotion regulation strategies as well as behavior inhibition system sensitivity, both of which are risk factors for the development of PTSD. This relationship is not well understood, with some research supporting a moderating role of experiential avoidance in the BIS-PTSD relationship and other research supporting a mediating role. Using a co-ed college student sample (N = 370; 78.4% Female), the current study aimed to compare both a moderated and mediated model as well as attempt to understand what role sex might play in these models. Results support a moderated mediation model, with experiential avoidance serving as the mediator between behavior inhibition sensitivity and post-traumatic stress symptom severity, with sex acting as a moderator for this relationship. Implications and directions for future research are discussed.

1. Introduction

Posttraumatic stress disorder (PTSD) is a serious mental illness that may develop subsequent to an individual experiencing a traumatic event. PTSD is characterized by psychological distress upon reminders of the trauma, exaggerated physiological responses, avoidance of reminders of the traumatic experience, changes in mood and cognition, and decreased emotional reactivity (American Psychological Association [APA], 2013). Within the span of a year, approximately 70% of the population will experience a traumatic event (Breslau, Davis, Andreski, & Peterson, 1991; Kilpatrick, Saunders, Veronen, Best, & Von, 1987; Resnick, Kilpatrick, Dansky, Saunders, & Best, 1993) and an average of 18–25% of these individuals will subsequently develop PTSD (Breslau et al., 1991; Resnick et al., 1993). Further, traumatic event exposure and subsequent PTSD symptoms are common for college students, and trauma exposure is also associated with additional psychopathological symptoms (Tripp, McDevitt-Murphy, Avery, & Bracken, 2015). It is estimated that 6–12% of students who have experienced a traumatic event develop symptoms severe enough to warrant a PTSD diagnosis (Bernat, Ronfeldt, Calhoun, & Arias, 1998; Frazier et al., 2009). Additionally, research suggests that women are more vulnerable to develop PTSD subsequent to trauma exposure in comparison to men, emphasizing the importance of understanding what may influence the increased risk of PTSD development for women (Gavranidou & Rosner, 2003; Tolin & Foa, 2008). Specifically, sex differences in PTSD risk also exists in other PTSD-related risk factors, such that women are more likely to report maladaptive emotion regulation and behavior inhibition system (BIS) sensitivity (Gratz et al., 2011; Tull, Gratz, Latzman, Kimbrel, & Lejuez, 2010).

1.1. Emotion regulation and PTSD

Emotion regulation is broadly defined as the ability to understand and effectively modulate emotional experiences through situational, attentional, cognitive, or behavioral strategies (Gross, 1998). Experiential avoidance is a functional class of maladaptive emotion regulation strategies aimed at reducing the form and frequency of unwanted experiences, such as what emotions are experienced, through what form they are experienced (i.e., memories), and how often they are experienced (Hayes, Wilson, Gifford, Follette, & Strosahl, 1996). Paradoxically, the use of experientially avoidant strategies likely increases the frequency and the intensity of such experiences. Research evidence suggests that maladaptive emotion regulation, such as experiential avoidance, is associated with PTSD symptom severity (Cisler, Olatunji, Feldner, & Forsyth, 2010; Tull, Barrett, McMillan, & Roemer, 2007). Specifically, maladaptive emotion regulation, including experiential

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avoidance, has been implicated in the development (Bardeen, Kumpula, & Orcutt, 2013; Plumb, Orsillo, & Luterek, 2004) and the maintenance of PTSD symptoms (Badour & Feldner, 2013; Fairholme et al., 2013; Tull et al., 2007). Further, sex differences in maladaptive emotion regulation (Gratz et al., 2011; Gratz & Roemer, 2004) may be related to the differential prevalence rates observed in PTSD symptoms between women and men (Gavranidou & Rosner, 2003; Tolin & Foa, 2008); however, this has not been examined. Although emotion regulation likely leads to or influences the dysfunctions in cognitive, emotional, and physiological processes theorized to underlie the development and maintenance of PTSD symptoms (Brewin, Dalgleish, & Joseph, 1996; Ehlers & Clark, 2000; Foa & Kozak, 1986; Frewen & Lanius, 2006), the mechanisms are not well understood. Various self-contexts in which one uses self-regulatory strategies, such as to manage the heightened emotional reactivity associated with temperamental vulnerability, are suggested as important considerations for the development of psychopathology (Bijttebier, Beck, Claes, & Vandereycken, 2009). Therefore, in an attempt to understand the mechanisms related to PTSD symptom severity, the current study examined the sex difference associated with the relationship between experiential avoidance and temperamental vulnerability (i.e., BIS sensitivity).

1.2. Reinforcement sensitivity theory, emotion regulation, and PTSD

The revised Reinforcement Sensitivity Theory (rRST; Corr, 2008; Gray & McNaughton, 2000) outlines three interrelated neurobiological systems (i.e., behavioral approach system [BAS], behavioral inhibition system [BIS], and fight-flight-freeze system [FFFS]) that together influence individual variation in personality, motivations and emotional responses. The BAS governs behavioral reactions to rewards, the FFFS controls avoidance and fear-motivated behavior in response to threat, and the BIS is responsible with balancing the BAS and FFFS when the two systems are discordant (Corr, 2004; Gray & McNaughton, 2000). Variations in BIS-FFFS and BAS sensitivity relate to a range of psychological disorders (Bijttebier et al., 2009), and contention between the BAS and FFFS stimulates BIS activation and results in increased anxiety and emotional reactivity (Corr, 2004). Sensitivity of the BIS to the threat and fear initiated by the FFFS may lead to the engagement of maladaptive emotion regulation strategies to manage the resultant heightened emotional reactivity; increasing risk for problematic outcomes. Indeed, maladaptive self-regulatory processes have been implicated in development of psychopathology when personality or temperamental dispositions, such as BIS sensitivity, are associated with increased emotional reactivity (Aldao, Nolen-Hoeksema, & Schweizer, 2010; Bijttebier et al., 2009; Calkins & Fox, 2002; Lonigan & Phillips, 2001). The development and maintenance of PTSD is no exception.

Previous research suggests that BIS sensitivity predicts PTSD symptom severity due to the associations that BIS sensitivity has to experiential avoidance and maladaptive emotion regulation (Hannan & Orcutt, 2013; Maack, Tull, & Gratz, 2012). Pickett, Bardeen, and Orcutt (2011) found that experiential avoidance moderated the relationship between BIS sensitivity and PTSD symptom severity in a female college student sample. Specifically, heightened BIS sensitivity and greater experiential avoidance predicted the worst PTSD symptom severity. Hannan and Orcutt (2013) and Maack et al. (2012) examined two different emotion regulation variables as mediators in the BIS sensitivity-PTSD symptom severity relationship in co-ed samples: emotion dysregulation and experiential avoidance. Regardless of whether emotion dysregulation or experiential avoidance was the mediator variable, the findings were similar. Specifically, experiential avoidance fully explained the relationship between BIS sensitivity and PTSD symptom severity (Maack et al., 2012), whereas emotion dysregulation partially explained the relationship between BIS sensitivity and PTSD symptom severity. Unfortunately, sex differences were not examined in either of these studies. Although it is clear that emotion regulation broadly, and experiential avoidance specifically, play a role in the relationship between BIS sensitivity and PTSD symptom severity, two questions still remain. First, what is the nature of the relationship between BIS sensitivity and emotion regulation? It is not clear if heightened BIS sensitivity leads to heightened emotional reactivity that is either adaptively or maladaptively regulated resulting in differing PTSD symptom outcomes *or* if heightened BIS sensitivity leads to the engagement of maladaptive strategies thus resulting in worsened PTSD symptom severity. Second, given that there are sex differences in BIS sensitivity, emotion regulation, and PTSD development risk, what role does sex play in these models? The current study aimed to examine sex differences in two competing models to clarify the BIS sensitivity, experiential avoidance, and PTSD symptom severity relationship.

1.3. Current study

The current study investigated the association between BIS sensitivity, experiential avoidance, sex, and post-traumatic symptom (PTSS) severity in a co-ed sample. The first aim was to compare a moderated model of BIS sensitivity and experiential avoidance predicting PTSS severity (e.g., Pickett et al., 2011) with a mediated model of BIS sensitivity predicting PTSS severity indirectly through experiential avoidance (e.g., Hannan & Orcutt, 2013; Maack et al., 2012) in a co-ed sample. The second aim of the study was to examine if sex moderated the relationships between the study variables, either by moderating the relationship between experiential avoidance and BIS sensitivity predicting PTSS severity in the moderated model, or via a conditional indirect effect, with sex serving as a moderator for the relationship between BIS and experiential avoidance, and experiential avoidance and PTSS severity in the mediation model. Given that women report heightened BIS sensitivity, greater experiential avoidance, and are at increased risk for PTSD compared to men, it was expected that sex would serve as a moderator in either model with women having a stronger relationship between the study variables.

2. Methods

2.1. Participants

468 Participants were recruited from the psychology department subject pool at a large Midwestern university. Participants were given partial research credit in exchange for participation. Requirements for participation were fluency in English and a minimum age of 18 years. Seventy-four participants had not experienced at least one traumatic event (as measured by the Traumatic Life Events Questionnaire; TLEQ; Kubany et al., 2000; Kubany, Leisen, Kaplan, & Kelly, 2000) and were thus excluded from analyses. Further, 24 participants were missing data on at least one variable of interest, including one participant who choose not to respond to the demographic question about sex, and were excluded from further analysis. This brought the final sample size to 370. Of the remaining participants, most identified as Female (n = 291; 78.6%) and White (77.0%), with 11.9% identifying as Black/African American, 2.4% as Asian, 0.5% as American Indian or Alaska Native, 0.5% as Native Hawaiian or other Pacific Islander, 6.5% as “other,” and 1.1% chose not to report their race. Additionally, 2.4% of participants identified their ethnicity as Hispanic or Latino and 0.5% chose not to report their ethnicity. Age of participants ranged from 18 to 56 years with a mean age of 21 years.

2.2. Procedure

After the informed consent process, participants completed a series of paper-and-pencil questionnaires in groups of 18 or less, which was dependent on the size of the data collection room. Desktop dividers were used to increase privacy between participants. Upon completion, participants were debriefed and granted research credit to fulfill the research requirement in their course.