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Gender Difference in Attentional Bias Toward Negative and Positive Stimuli in Generalized Anxiety Disorder

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Females are two times as likely as males to develop generalized anxiety disorder (GAD; Steiner et al., 2005; Vesga-López et al., 2008). Moreover, the clinical presentation of GAD is different across genders. One explanation for these differences may be the role of cognitive biases involved in GAD between genders. In the present study, we used an exogenous spatial cueing task to examine gender differences in attentional bias for negative and positive information in 118 individuals with a primary diagnosis of GAD. Males and females did not differ in their attentional bias for idiographically selected negative or neutral words. However, women showed a significantly larger attentional bias for positive words than did men. Results suggest that developing gender-specific treatments for GAD could improve treatment response rates.

Keywords: generalized anxiety disorder; attentional bias; gender

GENERALIZED ANXIETY DISORDER (GAD) is characterized by excessive worry about different domains of life (e.g., financial, social, etc.; American Psychiatric Association, 2013; DSM-5). GAD is associated with increased health care costs and decreased work productivity (Greenberg et al., 1999). Moreover, GAD is often comorbid with other anxiety and mood disorders (Brown, Campbell, Lehman, Grisham, & Mancill, 2001) and impacts the individual's quality of life (Wittchen, Carter, Pfister, Montgomery, & Kessler, 2000). Finally, GAD has the lowest rate of remission after treatment when compared to other anxiety disorders (Borkovec & Newman, 1998; Borkovec & Whisman, 1996; Clark, 1996; Steinert, Hofmann, Leichsenring, & Kruse, 2013).

One explanation for low remission rates in GAD may be that the cognitive mechanisms underlying this disorder are poorly understood, leading to poor treatment development. For example, cognitive models of GAD suggest that attentional bias toward emotional information plays a causal role in the etiology and maintenance of anxiety (Mathews & MacLeod, 2002; Mogg & Bradley, 2005). However, studies show conflicting patterns of attentional bias in GAD. For example, Bradley, Mogg, White, Groom, and de Bono (1999) found that GAD patients showed an attentional bias toward negative stimuli throughout the entire experiment, but displayed an attentional bias toward positive stimuli only during the second half of the experiment. Mogg, Millar, and Bradley (2000) found that GAD patients without comorbid

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depression were more likely to look at negative stimuli before neutral stimuli in comparison to nonanxious control and depressed participants. However, they did not find any significant differences in participants' reaction time data. Finally, Yiend and colleagues (2014) found that GAD patients were faster at disengaging their attention from negative compared to neutral stimuli.

One reason for the discrepant results may be that there exist moderators (e.g., gender, age, comorbid depression) of the relationship between attentional bias and GAD. For example, women with GAD are more likely than men to report experiencing fatigue, irritability, muscle tension, and somatic symptoms as a result of their worries (Steiner et al., 2005; Vesga-López et al., 2008). Women are also twice as likely as men to be diagnosed with GAD and report greater disability as a result of their worries than do men (Vesga-López et al., 2008). Women with GAD are more likely than men to be unemployed (Angst, Gamma, Baldwin, Ajdacic-Gross, & Rössler, 2009) or to be employed part-time rather than full-time (Steiner et al., 2005). Furthermore, longitudinal studies suggest that females with GAD have worse treatment outcome than do males (Rubio & López-Ibor, 2007), even when controlling for other factors such as depression (Rodriguez et al., 2006). On the other hand, men are significantly more likely than women to have a comorbid alcohol or substance use disorder and to report that their excessive worry leads to arguments and friction with relatives and friends (Vesga-López et al., 2008). Thus, the presentation of GAD differs by gender.

Moreover, researchers have examined gender differences in attentional bias to negative stimuli in various nonclinical samples. Waters, Nitz, Craske, and Johnson (2007) found that the emotional valence of stimuli did not affect men's performance on a probe detection task, but threatening stimuli differentially influenced low trait anxious and high trait anxious females. Another study (Merritt, Hirshman, Wharton, Stangl, Devlin, & Lenz, 2007) suggests, in an endogenous cueing task, that women show costs from an invalid cue when compared to no cue, while men are faster at responding to invalid cues than no-cue control trials. Tran, Lamplmayr, Pintzinger, and Pfabigan (2013) investigated gender differences in attentional bias toward positive and negative faces using a dot probe task. These researchers found that high anxious women showed an attentional bias toward angry faces. On the other hand, high anxious men showed an attentional bias toward happy faces.

In summary, attentional bias plays a role in GAD, there are gender differences in the presentation of GAD, and gender has been linked to differences in attentional bias. Thus, in the current study, we examine attentional bias for negative, positive, and neutral information in 118 individuals with a primary diagnosis of GAD. Based on previous research suggesting women show greater costs related to emotional stimuli (Waters et al., 2007) and invalidly cued trials (Merritt et al., 2007), we hypothesized that women would display greater attentional bias for emotional stimuli when compared to men.

Method

PARTICIPANTS

Participants comprised 124 patients recruited for an ongoing clinical trial of GAD (ClinicalTrials.gov: NCT00602563). Participants were between the ages of 18 and 65 years and were diagnosed with GAD as their primary diagnosis according to the Structured Clinical Interview for the DSM-IV (SCID-IV; First & Gibbon, 2004).[1] Licensed clinical psychologists, postdoctoral fellows, and advanced graduate students, who were supervised by the clinic director, administered the SCID-IV, the Hamilton Anxiety Rating Scale (HARS; Hamilton, 1959), and the Sheehan Disability Scale (Leon, Shear, Portera, & Klerman, 1992). The GAD module was administered to all participants, and additional modules were administered if symptoms of another disorder were reported during the general SCID screening and clinical interview.[2] All procedures were conducted with the approval of the San Diego State University Institutional Review Board. All participants provided written informed consent.

INSTRUMENTS AND MEASURES

Prior to completing the computer tasks, participants completed several self-report questionnaires. The Penn-State Worry Questionnaire (PSWQ; Meyer, Miller, Metzger, & Borkovec, 1990) is a 16-item measure of worry. Scores on this questionnaire range from 16 to 80. Meyer and colleagues (1990) found that the mean PSWQ score for participants with GAD was 64.1. Test-retest reliability ranges from .74 to .93, while internal consistency scores ranged from .91 to .95 (Meyer et al., 1990). The State-Trait Anxiety Inventory (STAI; Spielberger, Gorsuch,

[1] The center's diagnostic reliability is high ($\kappa = 0.89$; Amir et al., 2009).

[2] Similar to findings from past GAD studies, our sample had a high comorbidity rate: 23 men (60.53%) and 25 women (31.25%) were diagnosed with at least one comorbid disorder. Five men and six women were diagnosed with comorbid depression; seven men and no women were diagnosed with a comorbid substance use disorder.