Available online at www.sciencedirect.com
SCIENCE DIRECT®
ELSEVIER
Behaviour Research and Therapy 43 (2005) 1281–1310
BEHAVIOUR RESEARCH AND THERAPY
www.elsevier.com/locate/brat

Preliminary evidence for an emotion dysregulation model of generalized anxiety disorder

Douglas S. Mennin*, Richard G. Heimberg, Cynthia L. Turk, David M. Fresco

Adult Anxiety Clinic of Temple University, Philadelphia, PA 19122, USA

Received 15 January 2004; received in revised form 21 May 2004; accepted 11 August 2004

Abstract

Three studies provide preliminary support for an emotion dysregulation model of generalized anxiety disorder (GAD). In study 1, students with GAD reported heightened intensity of emotions, poorer understanding of emotions, greater negative reactivity to emotional experience, and less ability to self-soothe after negative emotions than controls. A composite emotion regulation score significantly predicted the presence of GAD, after controlling for worry, anxiety, and depressive symptoms. In study 2, these findings were largely replicated with a clinical sample. In study 3, students with GAD, but not controls, displayed greater increases in self-reported physiological symptoms after listening to emotion-inducing music than after neutral mood induction. Further, GAD participants had more difficulty managing their emotional reactions. Implications for GAD and psychopathology in general are discussed.

Keywords: Generalized anxiety disorder; Emotion regulation; Worry

Introduction

Approximately 5% of people will suffer from generalized anxiety disorder (GAD) at some point in their lives (Kessler et al., 1994). GAD is associated with significant role impairment (Wittchen, Zhao, Kessler, & Eaton, 1994), increased health care utilization (Blazer, Hughes, & George,

*Corresponding author. Department of Psychology, Yale University, Box 208205, New Haven, CT 06520, USA. Tel.: +1 203 432 2516; fax: +1 203 432 7172.
E-mail address: doug.mennin@yale.edu (D.S. Mennin).

0005-7967/$ - see front matter
doi:10.1016/j.brat.2004.08.008

1991), increased health care costs and decreased productivityy (Greenberg et al., 1999). However, despite the prevalence of GAD and the suffering associated with it, GAD remains poorly understood relative to other anxiety disorders and, as a result, has been more difficult to treat. When compared to the other anxiety disorders, far fewer investigations have examined the psychopathological mechanisms involved in GAD (Dugas, 2000).

Recently, theorists have begun to expand our understanding of GAD through the development of models that highlight the importance of worry. One of the most comprehensive accounts of the role of worry in GAD is Borkovec's *avoidance theory* (e.g., Borkovec, Alcaine, & Behar, 2004). Borkovec and colleagues have presented convincing empirical support for the notion that worry is a perseverative, cognitive activity that serves an avoidance function for persons with GAD. More specifically, Borkovec and colleagues argue that worry allows individuals to approach emotional topics at an abstract, conceptual level and, consequently, to avoid aversive images, autonomic arousal, and intense negative emotions in the short-run (for a review of numerous studies in support of this view, see Borkovec et al., 2004). However, over the long term, the individual is repeatedly confronted with the emotional material, frequently has a more intense experience of anxiety, and engages in repetitive worry to "dull" this experience. In doing so, the person again fails to fully confront the distressing stimuli, and emotional processing of aversive experiences is inhibited.

As described above, from the perspective of the avoidance theory of worry, worry facilitates avoidance of the imagery and physiological arousal associated with negative emotion. However, the nature of the emotional experience that prompts individuals with GAD to engage in frequent avoidance strategies such as worry has not been directly addressed. Although individuals with GAD may use worry to avoid distressing emotional experience, the theory does not explain why this experience is so aversive that it would need to be avoided. To understand this, the characteristics of the emotional experience that may prompt avoidance need to be explored. Further, emotion may play a larger role in GAD than specifically in relation to worry. Emotion and its dysregulation may be integral, yet largely unexplored, factors in the psychopathology of GAD and thus may have important implications for treatment (see Samoilov & Goldfried, 2000).

Conceptualizations of GAD may benefit from attention to advances in the fields of emotion theory (e.g., Ekman & Davidson, 1994), emotion regulation (e.g., Gross, 1998), and affective neuroscience (e.g., LeDoux, 1996). Contemporary theories of emotion emphasize its adaptive value (e.g., Gross, 1998). Theorists have argued that emotions are cues for readiness for action or "action tendencies" that work to establish, maintain, or disrupt relationships with particular internal and external environments that signify importance to the person (see Barlow, 2002). Emotion serves an information function, notifying individuals of the relevance of their concerns, needs, or goals in a given moment. Attention to the adaptive value to emotions may account for the resurgence of interest in the role of emotion in psychopathology and psychotherapy (e.g., Berenbaum, Raghavan, Le, Vernon, & Gomez, 2003; Greenberg, 2002; Kring & Bachorowski, 1999; Samoilov & Goldfried, 2000).

Emotion regulation, as a field of study, examines how individuals influence, control, experience, and express their emotions (Gross, 1998, p. 275). In discussing regulation of one's own emotions, Thompson (1990) stresses the importance of the restraint of emotion, as well as its maintenance and enhancement. Clearly, needs to diminish emotional arousal to work effectively or contain one's anger in a public setting are aspects of emotion regulation. However, investigators have