



Time course of threat responding in panic disorder and depression



Stephanie M. Gorka, Huiting Liu, Casey Sarapas, Stewart A. Shankman *

University of Illinois at Chicago, Department of Psychology, 1007 West Harrison St. (M/C 285), Chicago, IL 60657, United States

ARTICLE INFO

Article history:

Received 19 August 2014

Received in revised form 7 May 2015

Accepted 6 July 2015

Available online 11 July 2015

Keywords:

Panic disorder

Major depressive disorder

Startle

Time course

Affective chronometry

ABSTRACT

Heightened sensitivity to threat is a characteristic feature of panic disorder (PD). It is also a factor that is considered to be central to PD but not major depressive disorder (MDD) — a related disorder that commonly co-occurs with PD. However, sensitivity to threat is a broad construct and it is unclear whether individuals with PD exhibit heightened initial threat reactivity, impairments in modulating their threat responding over time, or both. It is also unclear how these different facets of threat responding apply to predictable and/or unpredictable threat. The aim of the current study was to examine whether there are differences in initial threat reactivity and the time course of threat responding during predictable and unpredictable threat-of-shock in 186 adults with: 1) current PD and no history of depression (i.e., PD-only), 2) current MDD and no history of an anxiety disorder (i.e., MDD-only), 3) current comorbid PD and MDD, or 4) no lifetime history of psychopathology (i.e., controls). Threat responding was assessed using an electromyography startle paradigm. Relative to controls, individuals in the three psychopathology groups exhibited heightened initial threat reactivity to predictable and unpredictable threat and did not differ from each other. Multilevel mixed model analyses indicated that those with PD evidenced less of a decline over time in startle responding during unpredictable threat relative to those without PD. Those with MDD displayed a greater slope of decline in startle responding during predictable threat compared with those without MDD. The pattern of results suggests that there may be conceptual differences between measures of initial threat reactivity and time course of threat responding. Moreover, time course of threat responding, not initial threat reactivity, may differentiate PD from MDD.

© 2015 Elsevier B.V. All rights reserved.

1. Introduction

Epidemiological data indicate that concurrent diagnoses of depression and anxiety are common (Kendler et al., 2003; Vollebergh et al., 2001). Among those with major depressive disorder (MDD), 58% have a lifetime diagnosis of any anxiety disorder (Kessler et al., 1996, 2005). The rate of comorbid depression within anxiety disorder patients is similar, though rates vary by type of anxiety disorder (Clark, 1989; Kessler et al., 1997). In all cases, comorbidity rates far exceed what would be expected by chance.

Numerous theories have attempted to explain this common co-occurrence by identifying the factors that are common to the two classes of disorders and those that are unique (see Shankman and Klein, 2003). In other words, studies have sought to delineate what traits/characteristics are related to depression and anxiety (i.e., shared), and what traits/characteristics are related to depression but not anxiety and vice versa (i.e., unique). The original tripartite model posited that high negative affectivity was common to both depression and anxiety, whereas low positive affectivity was unique to depression and heightened physiological

arousal was unique to anxiety (Clark and Watson, 1991). Over the past two decades, there have been several revisions to the tripartite model (Mineka et al., 1998; Watson, 2009). To date, high negative affectivity is still considered shared between depression and anxiety, and low positive affectivity unique to depression. However, the unique features of anxiety disorders are unclear and it has been postulated that the traits/characteristics that differentiate one anxiety disorder from depression may be different than the traits/characteristics that differentiate another anxiety disorder from depression (Heller and Nitscke, 1998; Watson, 2009).

Along these lines, accumulating research and theory suggests that heightened threat sensitivity may be specific to panic disorder (PD) (and potentially other fear-based disorders) relative to MDD (Gorman et al., 2001; Nelson et al., 2013; Shankman et al., 2013). However, it is important to note that ‘heightened threat sensitivity’ is a broad construct and it unknown whether individuals with PD exhibit heightened initial threat reactivity, impairments in modulating their threat responding over time, or both. The majority of prior studies have collapsed across aversive events to create an average level of responding (Grillon et al., 2004; 2008; Melzig et al., 2007). This approach increases reliability by averaging multiple responses, but fails to capture the pattern of responding over time (an approach called “affective chronometry;” Davidson, 1998). Thus, the precise nature of dysfunctional threat responding in individuals with PD cannot be inferred.

* Corresponding author at: University of Illinois at Chicago, 1007 W. Harrison St. (M/C 285), Chicago, IL 60657, United States.

E-mail addresses: sgorka2@uic.edu (S.M. Gorka), hliu74@uic.edu (H. Liu), csarap2@uic.edu (C. Sarapas), stewarts@uic.edu (S.A. Shankman).

Examining the pattern of threat responding over time may help elucidate distinct disease mechanisms that are conflated by only examining differences in average responding (Gross, 1999; Werner and Gross, 2010). Ideally, studies would allow for separate examinations of initial affective reactivity and change in responding over time, as data suggests that the two measures are different (e.g., Gorka et al., 2013a, 2013b; Campbell et al., 2014; Mogg et al., 2004). For example, the former may reflect initial stimulus processing, while the latter may reflect inhibitory processes (Banks et al., 2007; Phan et al., 2005).

A common approach to studying time course of responding is to examine habituation — often defined as the gradual decrease in physiological responding to a stimulus over time (Harris, 1943; Herry et al., 2010). Habituation is considered an adaptive response style to an ongoing stimulus (Groves and Thompson, 1970; Herry et al., 2010; Rankin et al., 2009). A slower rate (or lack) of response reduction is conceptualized as an index of sustained heightened vigilance (Oken et al., 2006). Roth et al. (1990) found that individuals with PD evidenced deficits in the rate of reduction of skin conductance responses to aversive auditory tones. More recently, it has been shown that those with PD, relative to healthy controls, exhibit increased respiratory reactivity and a lack of habituation over time in response to a panicogenic carbon-dioxide challenge (Blechert et al., 2010). Although considerably less work has been done examining the time course of affective processing in MDD, studies typically suggest that individuals with MDD exhibit normal rates of habituation to threatening stimuli (e.g., Taiminen et al., 2000). Taken together, the existing literature suggests that 'heightened sensitivity to threat' in PD patients could reflect heightened initial reactivity, deficits in the reduction of responding over time, or some combination of these. It is also possible that individuals with MDD exhibit a form of abnormal threat responding which has not been captured by traditional averaging of responses, such as increased reactivity but normal habituation.

Another important factor related to threat sensitivity that impacts responding is whether or not the threat is temporally predictable or unpredictable (Abbott et al., 1984; Grillon et al., 2008; Shankman et al., 2014). Broadly, predictable threat elicits a phasic response to an identifiable stimulus (labeled *fear*), while unpredictable threat elicits a generalized feeling of apprehension not associated with a clearly identifiable source (labeled *anxiety*; Davis, 1998; Barlow, 2000). These two types of threat have been shown to elicit qualitatively distinct aversive states (Davis, 1998; Davis et al., 2010; Grillon et al., 2006), and have overlapping, yet separable neural correlates (Alvarez et al., 2011; Davis, 2006).

In order to assess fear and anxiety responses separately, Grillon and colleagues developed the NPU-threat paradigm (Grillon et al., 2004; Schmitz and Grillon, 2012). The task includes three within-subjects conditions: 1) no threat (N; subjects are safe from aversive stimuli), 2) predictable threat (P; aversive stimuli are signaled by short duration cues), and 3) unpredictable threat (U; aversive stimuli are not signaled). Throughout conditions, startle eyeblinks in response to probes (e.g., short bursts of white noise) are recorded as indices of aversive responding (Bradley et al., 1999; Lang, 1995).

Using this paradigm (and its variants), two separate studies have demonstrated that individuals with PD evidence greater average startle responding during anticipation of threat relative to healthy controls (Grillon et al., 2008; Shankman et al., 2013) and individuals with MDD (Shankman et al., 2013). Specifically, both studies found that PD was associated with heightened startle potentiation to unpredictable threat; however, only Shankman et al. (2013) found that PD was also associated with heightened startle to predictable threat. A third study using the NPU-threat paradigm found that MDD was associated with greater startle responding across predictable, unpredictable, and no-shock conditions compared with healthy controls (Grillon et al., 2013); although, Shankman et al. (2013) did not find any association between MDD and startle responding. Thus, there have been some discrepant findings in the literature. First, it is unclear whether PD is associated with responding to predictable and unpredictable threat; although, studies

using other task designs suggest that PD may be related to both forms of threat (e.g., Gorman et al., 2001; Melzig et al., 2007). Second, because of the differing findings between Grillon et al. (2013) and Shankman et al. (2013), the role of MDD in threat responding is unclear.

Using startle paradigms other than NPU, it has been shown that healthy controls and individuals with a current anxiety disorder both display elevated startle potentiation when viewing unpleasant pictures; however, individuals with an anxiety disorder and comorbid depression have blunted startle (Taylor-Clift et al., 2011). Additionally, in a sample of adolescents with principal fear disorders (i.e., specific and social phobia), distress disorders (i.e., MDD, dysthymia, generalized anxiety disorder, and PTSD), and controls, Waters et al. (2014) found that those with a principal fear disorder, relative to the other two groups, exhibited greater startle during safety conditions and during early phases of explicit threat (i.e., an aversive event was possible but it would not occur for another 10–50 s). Meanwhile, adolescents with principal distress disorders displayed blunted startle responding during baseline and contextual threat conditions (i.e., aversive events would happen later in the task and participants were told they would be notified of the timing) relative to individuals without principal distress disorders. These studies highlight the conflicting findings within the startle literature, and also point to the fact that the type and timing of threat may have an important impact on the pattern of results.

The aim of the current study was to examine whether there are group differences in initial threat reactivity and the time course of threat responding among individuals with PD and/or MDD. Data for this study came from Shankman et al. (2013), which reported that individuals with PD (with and without MDD) evidence heightened startle potentiation to predictable and unpredictable threat compared to individuals with MDD-only and healthy controls. As was noted above, this original study collapsed across responses to create condition averages and thus, did not separate initial reactivity and time course effects. It is hypothesized that individuals with PD (with and without MDD) will display increased initial reactivity and a lack of reduction in responses over time during both predictable and unpredictable threat relative to individuals without PD. In regard to MDD-only, the majority of existing studies suggest that individuals with MDD-only display blunted startle to unpleasant stimuli (see Vaidyanathan et al., 2009 for a review); although, in the current sample, Shankman et al. (2013) found no effect of MDD. Given this difference, and a study by Cuthbert et al. (2003) noting that depressed individuals displayed increased initial startle reactivity, we hypothesized that the MDD-only group will exhibit increased initial reactivity but a greater rate (or slope) of reduction in responses over time during both predictable and unpredictable threat relative to individuals without MDD. Lastly, because there was no impact of co-occurring MDD or PD in Shankman et al. (2013), we did not hypothesize that there would be differences in the pattern of results for individuals with co-occurring MDD and PD relative to individuals with PD-only and MDD-only.

2. Methods

The study protocol has been described in detail elsewhere (see Shankman et al., 2013). In brief, sensitivity to predictable and unpredictable threat was examined in four groups of individuals with current: (1) PD without a lifetime history of MDD ($n = 28$), (2) MDD without a lifetime history of an anxiety disorder ($n = 38$), (3) comorbid PD and MDD ($n = 56$), and (4) healthy controls with no lifetime history of Axis I psychopathology ($n = 64$). Diagnoses were made via the Structured Clinical Interview for DSM-IV (SCID; First et al., 1996). Participants in the PD-only and comorbid groups were allowed to have additional current or past anxiety disorders. Participants in the MDD-only group were required to have no current or past anxiety disorder. In addition, as part of the aims for the larger study, and in an attempt to reduce heterogeneity within depressed individuals, participants in the MDD-only and comorbid PD and MDD groups were required to have a first onset

Download English Version:

<https://daneshyari.com/en/article/930974>

Download Persian Version:

<https://daneshyari.com/article/930974>

[Daneshyari.com](https://daneshyari.com)