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Trait rumination predicts onset of Post-Traumatic Stress Disorder through trauma-related cognitive appraisals: A 4-year longitudinal study

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ABSTRACT

Trauma-related rumination and worry predict chronic PTSD. This study examined whether habitual rumination and worry measured prior to trauma exposure make persons more vulnerable to the onset of PTSD, presumably because habitual ruminators and worriers will be more prone to cognitively appraise trauma exposure in a negative way. A sample of 2981 adults aged 18–65, consisting of healthy controls and persons with past or current depressive and/or anxiety disorders were assessed at baseline and at follow-up four years later (n = 2402). At follow-up, 359 participants reported exposure to a traumatic event during the last four years of whom 52 (14.4%) had developed PTSD. Pre-trauma self-reported depression severity and trait rumination – but not trait worry-predicted onset of PTSD during follow-up, controlling for demographic and clinical history variables, as well as psychiatric diagnoses at baseline. The relation of trait rumination with onset of PTSD was partly mediated by the cognitive appraisal of the traumatic event and not by the affective reaction to trauma exposure. Repetitive negative thinking in the form of rumination may be a risk factor for onset of PTSD amenable to prevention and intervention.

1. Introduction

Trauma-related rumination, defined as repetitive and recurrent thinking about the trauma and its consequences (Michael, Halligan, Clark, & Ehlers, 2007), has been proposed as a maladaptive cognitive coping strategy that maintains symptom levels or a diagnosis of PTSD (Ehlers & Clark, 2000; Wells & Sembi, 2004). In accordance with this presupposition, in numerous cross-sectional studies significant and moderately strong associations of trauma-related rumination with PTSD (symptoms) following different types of traumatic events have been found (Bennett & Wells, 2010; Clohessy & Ehlers, 1999; Ehlers, Mayou, & Bryant, 1998; Ehring, Frank, & Ehlers, 2008; Halligan, Michael, Wilhelm, Clark, & Ehlers, 2006; Hussain & Bhushan, 2011; Michael et al., 2007; Razik, Ehring, & Emmelkamp, 2013). Moreover, some prospective studies showed that trauma-related rumination assessed shortly after the trauma predicts PTSD some months later, also after controlling for initial symptom levels and/or other established predictors of PTSD (Ehring & Ehlers, 2014; Ehring et al., 2008; Kleim, Ehlers, & Glucksman, 2007; Michael et al., 2007). Lastly, experimental studies have demonstrated that the induction of rumination about a traumatic film or real-life stressor results in significantly more analogue PTSD symptoms and/or a significantly slower recovery from the stressor than control conditions (Ehring, Fuchs, & Klasener, 2009; Zetsche, Ehring, & Ehlers, 2009).

Worry, defined as "an attempt to engage in mental problem-solving on an issue whose outcome is uncertain but contains the possibility of one or more negative outcomes …" (Borkovec, Robinson, Pruzinsky, & DePree, 1983), constitutes another form of repetitive negative thinking (Watkins, 2008) and has been found to be associated with PTSD symptom severity following different types of traumatic events (Bardeen, Fergus, & Wu, 2013; Bennett, Beck, & Clapp, 2009; Pietrzak, Harpaz-Rotem, & Southwick, 2011; Rosenthal, Cheavens, Lynch, & Follette, 2006; Warda & Bryant,

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1998). Moreover, worry was predictive of the development of PTSD in traffic accident survivors (Holeva, Tarrier, & Wells, 2001) and in college students exposed to a significant life stressor (Roussis & Wells, 2008). Finally, worrying about an experimental stressor for a period of 4 min after exposure led to significantly more intrusions in the next 3 days than a settle-down control condition (Wells & Papageorgiou, 1995).

Taken together, these studies suggest that trauma-related rumination and worry constitute important cognitive risk factors for the maintenance of PTSD. We are not aware of studies that examined whether the propensity to repetitive negative thinking in the form of rumination or worry constitutes a pre-trauma cognitive risk factor for onset of PTSD and whether this effect of repetitive negative thinking on onset of PTSD is mediated by more negative cognitive appraisals of exposure to trauma. Individual differences in repetitive negative thinking as a transdiagnostic risk factor may not only be relevant for the onset and maintenance of depression and anxiety (Ehring & Watkins, 2008), but given the high levels of comorbidity and symptom similarity between depression, anxiety and PTSD (Brady, Killeen, Brewerton, & Lucerini, 2000; Spinhoven, Penninx, van Hemert, de Rooij, & Elzinga, 2014) this established risk factor for anxiety and depression may also serve as a risk factor for PTSD.

In a comprehensive review of cognitive risk factors for onset of PTSD (Elwood, Hahn, Olatunji, & Williams, 2009), reliance on cross-sectional designs and use of retrospective self-report measures are identified as a major study limitation of the extant literature. Ideally, studies of cognitive risk factors would include pre-trauma, peri-trauma, and post trauma assessments in order to improve our understanding of temporal relationships. Studies relying only on retrospective self-report data should include and control for measures of distress at the time of measurement. Finally, research examining cognitive risk factors will need to demonstrate that it can contribute above and beyond previously identified risk factors for PTSD (Elwood et al., 2009).

Risk-factor research may have clinical relevance and can inform the development of indicated and targeted prevention programs (Zvolensky, Schmidt, Bernstein, & Keough, 2006). In order to understand this translational link, some operational definitions of risk factors are necessary. Following Kraemer (Kraemer, Stice, Kazdin, Offord, & Kupfer, 2001) a risk factor can be defined as a factor that is related to, and temporarily precedes, a negative outcome. Causal risk factors are factors that when modified (e.g., by treatment) result in changes in outcome. Proxy risk factors are also related to a negative outcome, but this association is due to the proxy risk factor's relation with another causal risk factor. When a risk factor (e.g., gender) cannot be changed it is defined as a fixed marker of risk and not as a malleable risk factor. Our first study aim was to examine whether the inclination to repetitive negative thinking in the form of trait rumination and trait worry is a risk factor for the onset of PTSD and not a proxy risk factor due to its association with demographic and clinical severity and history variables. Moreover, we wanted to examine whether the predictive value of the inclination to repetitive negative thinking for onset of PTSD is mediated by cognitive rather than affective reactions to trauma exposure over and above the effect of other risk factors. Identification of repetitive negative thinking as a risk factor would pave the way for further studies examining whether it also constitutes a malleable causal risk factor (i.e., a factor when modified by treatment reduces the risk of post-traumatic stress reactions). We hypothesized that the inclination to repetitive negative thinking would independently predict PTSD onset and that cognitive reactions to trauma exposure would partly mediate this effect.

2. Methods

2.1. Sample

The Netherlands Study of Depression and Anxiety (NESDA) is an ongoing cohort study designed to investigate determinants, course and consequences of depressive and anxiety disorders. The NESDA sample of 2981 adults (18–65 years) includes participants with a life time and/or current anxiety and/or depressive disorder (n = 2329; 78%) and healthy controls (persons without depressive or anxiety disorders; n = 652; 22%). To include various developmental stages of disorders and different levels of severity, participants were recruited from general practices (n = 1610; 54%), mental health organizations (n = 807; 27%), and the general population (n = 564; 19%). Community-based subjects with depressive or anxiety disorders were previously identified in two population-based studies: Nemesis (Bijl, van Zessen, Ravelli, de Rijk, & Langendoen et al., 1998) and Ariadne (Landman-Peeters et al., 2005). Primary care patients were identified through a 3-stage screening procedure (involving the K10 and the CIDI short form) among patients of 65 General Practitioners consulting for any reason in a 4-month period. In secondary care, patients were recruited when newly enrolled for a depressive or anxiety disorder at one of the 17 participating mental health organization locations. General exclusion criteria were a primary clinically overt diagnosis of severe psychiatric disorders such as psychotic, obsessive compulsive, bipolar, post-traumatic stress or severe addiction disorder, and not being fluent in Dutch. A detailed description of the NESDA design and sampling procedures has been given elsewhere (Penninx et al., 2008). The research protocol was approved by the Ethical Committees of the participating universities and all respondents provided written informed consent.

The face-to-face baseline assessment included demographic and personal characteristics, a standardized diagnostic psychiatric interview, an extensive set of psychological measures and a medical assessment including blood sampling. After two (T2) and four (T4) years, a face-to-face follow-up assessment was conducted with a response of 87.1% (n = 2596) at T2 and of 80.6% (n = 2402) at T4.

2.2. Measures

2.2.1. Outcome variable

2.2.1.1. Onset of Post-Traumatic Stress Disorder (PTSD). In the T4 face-to-face interview, we preceded the PTSD Symptom Scale – Interview version (PSS–I; Foa, Riggs, Dancu, & Rothbaum, 1993) with the Life Events Checklist (LEC; Weathers, Keane, & Davidson, 2001). The LEC is developed to screen for potentially traumatic events that respondents may have experienced. The items for the LEC were generated via inspection of existing measures of potentially traumatic events, review of the PTSD literature to facilitate the identification of events known to culminate in PTSD, and consultation with researchers and clinicians possessing considerable expertise in PTSD (Gray, Litz, Hsu, & Lombardo, 2004). Because the LEC is designed as a screen for potentially traumatic events, it is not intended to establish definitively that an individual has experienced an event as defined in the A-criterion for traumatic exposure in DSM-IV.

The LEC consists of 16 items inquiring about the experience of 16 different potentially traumatic events known to result in PTSD or other posttraumatic difficulties and an item inquiring about any other inordinately stressful experiences not captured by the other 16 items. Participants were asked whether they had ever experienced any of these events, to indicate the most bothersome experience and to describe when the event started and ended. For the