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The association between traumatic life events and psychological symptoms from a conservative, transdiagnostic perspective

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ABSTRACT

Exposure to traumatic life events (TLEs) is strongly linked to the onset and exacerbation of an array of psychological sequelae. While studies yield minimal evidence of specificity for one disorder emerging in the aftermath of TLEs versus another, most studies do not adopt a conservative approach in controlling for multiple psychological symptoms linked to TLEs. The present study explored the association between TLEs and eight psychological constructs before and after adjusting for concurrent symptomatology in a diverse sample of 2342 undergraduates. We predicted three symptom domains would withstand conservative adjustments in their relationship to TLEs: posttraumatic stress disorder (PTSD), borderline personality disorder (BPD), and attenuated positive psychotic symptoms (APPS). Results indicated that exposure to at least one TLE, but especially four or more TLEs, was significantly associated with PTSD and BPD symptoms even after controlling for concurrent symptoms. Additionally, the association between four or more TLEs and APPS persisted despite adjusting for covariates. Findings underscore the critical role that TLE histories play in posttraumatic stress, borderline personality, and attenuated psychotic symptom expression. The relationship between TLEs and depression, cannabis and other drug use, generalized anxiety, and social anxiety disappeared after adjusting for comorbid symptoms.

1. Introduction

The diagnostic and symptom heterogeneity linked to exposure to traumatic life events (TLEs) is vast and complex, with TLEs often facilitating, exacerbating, and maintaining the onset, course, and recurrence of psychiatric disorders, as well as comorbid psychiatric presentations (Amstadter et al., 2013; Carr et al., 2013; Cutajar et al., 2010; Green et al., 2010; Hovens et al., 2012; MacMillan et al., 2001; Scott et al., 2012). The most commonly investigated disorder categories among these studies include substance use, mood, and anxiety, the latter which includes posttraumatic stress disorder (PTSD) given that the identified studies were conducted prior to Diagnostic and Statistical Manual of Mental Disorders (DSM) 5 publication. While the existing studies have strong methodological foundations, they do not yield information about the main effects of TLEs to specific psychiatric outcomes since they either 1) do not report on PTSD as an independent outcome, instead grouping PTSD within the larger anxiety disorder category, or reporting on psychiatric outcomes only in the presence of comorbid PTSD or 2) do not adjust for concurrent symptomatology.

Although many studies find minimal diagnostic specificity associated with TLEs (Green et al., 2010; Matheson et al., 2012; Scott et al., 2012; van Nierop et al., 2014), these studies are limited by at least one of three factors. First, their outcomes are often dichotomous diagnostic categories rather than continuous symptom cluster endorsement, the latter which yields a more nuanced representation of the construct of interest (Fisher et al., 2013). Second, many studies do not assess for concurrent psychotic (with the exception of Matheson et al. (2012) and van Nierop et al. (2014) or personality disorder symptoms, particularly borderline personality disorder (BPD), both which have been strongly linked to a TLE history (Pietrek et al., 2013; Zhang et al., 2012; Varese et al., 2012). Lastly, the main effects between TLEs and specific psychiatric outcomes are often not tempered by conservatively adjusting for comorbid symptoms, which is critical for constructs that involve substantial comorbid psychopathology (e.g., psychosis) and because individuals with TLE histories are more likely to present with a combination of symptoms or disorders (MacMillan et al., 2001; Murphy et al., 2013; van Nierop et al., 2014). To isolate a potential main effect of TLEs on risk for psychopathology, parsing out an extensive list of covariates is imperative (Murphy et al., 2013).

It remains unclear whether TLE exposure presents a general

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vulnerability existent in multiple disorders or is potentially linked to specific symptom constructs (e.g., depression, psychosis). To address this uncertainty, the current study aimed to determine whether a history of TLE exposure was associated with certain psychological domains after controlling for a comprehensive set of psychological symptoms, including PTSD, BPD, attenuated positive psychotic symptoms (APPS), depression (DEP), generalized anxiety (GENANX), social anxiety (SOCANX), cannabis use, and other drug use. To our knowledge, no study assessing the independent contribution of TLEs on psychiatric outcomes have examined the role of concomitant borderline and psychotic pathology. We hypothesized that, of the eight psychological constructs measured, PTSD, BPD, and APPS would be the specific outcomes that remain significantly associated with TLEs after adjusting for comorbid symptomatology. This hypothesis was based on several factors. The first is the robust associations that have been found between TLEs and PTSD, BPD, and APPS, with the TLE-APPS link persisting despite adjusting for a host of concurrent symptoms like depression and anxiety (Sunderland et al., 2016; Pietrek et al., 2013; Zhang et al., 2012; Varese et al., 2012). Second, while several studies have concluded that TLEs are not associated with specific symptom constructs, these studies have methodological limitations. In particular, they have 1) not assessed or adjusted for borderline and psychotic-like symptoms, 2) clustered PTSD with other anxiety disorders, or 3) examined only outcomes at the clinical disorder threshold. Lastly, although significant associations have been found between TLEs and GENANX, SOCANX, DEP, and substance use, these studies did not adjust for coexisting symptoms (Carr et al., 2013; Dube et al., 2003; Hovens et al., 2012; MacMillan et al., 2001). Therefore, it is important to further investigate whether symptom specificity exists in the aftermath of trauma.

2. Method

2.1. Participants

Participants included a socioeconomically and racially diverse sample of 2343 undergraduate students between the ages of 18 and 35 from a large urban university who were recruited across multiple disciplines via an online recruitment website. The study was approved by the university's Institutional Review Board and informed consent was obtained from all participants, who received course credit for their participation. Following informed consent, participants were directed to a laboratory computer where questionnaires were individually administered.

2.2. Measures

Traumatic life events exposure was evaluated with the 17-item Life Events Checklist (Gray et al., 2004). For the present study only responses of "happened to me" and "witnessed it" (the latter only for items where "happened to me" was not a viable option, such as sudden, violent death) were counted. Only 16 TLEs were assessed, as the "other" TLE category was excluded. This questionnaire has been shown to have good convergent validity with well-established measures of trauma histories, and also has been found to have moderate temporal stability (Gray et al., 2004). The frequency of attenuated (i.e., less frequent, severe, distressing or convincing) positive psychotic symptoms (APPS) in the past month while not under the influence of drugs, alcohol, or other medications, was measured with the 45-item positive symptom domain of the Prodromal Questionnaire (Loewy et al., 2007). The PQ has been found to demonstrate moderate concurrent validity, strong sensitivity, and moderate specificity with other semi-structured interviews that assess for psychosis (Kline et al., 2012; Miller et al., 2002). The depression dimension was measured with the brief version of the Center for Epidemiologic Studies-Depression Scale, which measures the presence and severity of depressive symptoms in the past week (Radloff, 1977). This scale has been found to be reliable and valid (Radloff, 1977; Roberts et al., 1989). Trait anxiety was assessed with the State Trait Anxiety Inventory Trait Form Anxiety Subscale; specifically, a version that excludes items that load predominantly on the depression factor (Bieling et al., 1998; Spielberger et al., 1983). The 20-item Social Phobia Scale assessed for the presence of anxiety symptoms associated with social performance on diverse tasks (Mattick and Clarke, 1998). Both anxiety scales have been found to demonstrate good construct, discriminant, and convergent validity, as well as test-retest reliability (Mattick and Clarke, 1998; Rule and Traver, 1983; Smeets et al., 1997; Spielberger et al., 1983). The 17-item PTSD Checklist-Civilian Version measured the presence and distress level of PTSD symptoms and has been found to have strong validity and reliability (Conybeare et al., 2012; McDonald and Calhoun, 2010). The McLean Screening Instrument for Borderline Personality Disorder examined BPD symptoms based on 10 true-false items derived from DSM-IV criteria, and has yielded good sensitivity and specificity (Zanarini et al., 2003). Substance use was assessed via the Drug Use Frequency Measure, which measures the frequency of use of various substances in the past three months on a scale ranging from "never" to "daily" (O'Farrell et al., 2003). This scale has been established to have adequate reliability and validity (O'Farrell et al., 2003). Cannabis and other drug use (i.e., amphetamines, opioids/heroin, and hallucinogens) was dichotomized into a "high" versus "low" use category based on a previous study using the same sample (Reeves et al., 2014).

2.3. Statistical analysis

Eighteen participants were removed from analyses since their age (> 35) was beyond the typical age of onset for schizophrenia spectrum disorders (American Psychiatric Association, 2013) and more than four standard deviations above the mean sample age. Continuous dependent variables were examined for normality based on visual inspection and skewness and kurtosis values. Bivariate analyses were used to determine whether significant differences existed among the independent and dependent variables (chi-square when both variables were dichotomous, ANOVAs when there was one continuous and one dichotomous variable, and Pearson correlations when both variables were continuous). Age and gender also were tested as potential covariates and included in models if significantly related to main independent (i.e., TLE variables) and dependent variables.

ANOVA was used to test the independent relation between TLEs and the six continuous psychological symptom variables. Logistic regression was used to test the independent relation between TLEs and the two substance use variables. To determine the strength of the relationship between TLE and the psychological symptom outcome variables, ANCOVA and logistic regressions were repeated, adjusting for all other comorbid symptoms. All models were conducted separately for Any TLE versus No TLE and four or more (4+) TLE versus No TLE. The latter category was created due to previous findings in a similar sample that 1) 4+ TLEs led to significantly higher APPS compared to individuals endorsing any, one, two, or three TLEs and that 2) the relationship between TLEs and APPS appears to plateau after four TLEs, suggesting that additional TLEs beyond four may not have additive or multiplicative influences in increasing risk for APPS (Gibson et al., 2014). The 4+ TLE threshold has also been associated with other negative outcomes, such as increased number of psychiatric diagnoses and risk for substance use, depression, and PTSD (Dube et al., 2003; Ippen et al., 2011; Putnam et al., 2013). Collinearity of models was tested by assessing for more conservative variance inflation factor (VIF) values (above 5.0, see Barrowclough et al., 2011) than the typical VIF of 10 rule of thumb (Cohen et al., 2003; Nachtsheim et al., 2004). To reduce the possibility of Type I error, Bonferroni corrected p values were used, such that $p < 0.05$ was divided by 8 (p=0.0063), which represents the number of models tested within each hypothesis