

From neuroticism to anxiety: Examining unique contributions of three transdiagnostic vulnerability factors

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ABSTRACT

Neuroticism has been implicated in many forms of psychopathology. Additional transdiagnostic factors such as shame, psychological inflexibility, and emotion dysregulation may explain the association between neuroticism and anxiety. While past work has, to some degree, evaluated these factors that cut across diagnostic categories, no study has evaluated them jointly to examine unique explanatory value over and above shared variance and/or general distress. The indirect effects of neuroticism via three transdiagnostic factors (shame, psychological inflexibility, and emotion dysregulation) on anxiety symptoms were evaluated among 97 inpatient adolescents (63.9% female; $M = 15.23$; $SD = 1.43$) using three separate measures of anxiety (two self-report and one diagnostic symptom count) as well as a composite anxiety severity outcome variable comprised of all three measures. As expected, neuroticism was significantly associated with anxiety symptoms and all three transdiagnostic factors. Neuroticism via shame was the only significant indirect effect and was present in all models. The indirect effects were of medium size. Competing models testing alternative pathways were rejected, adding confidence to the significant findings of neuroticism via shame. Data were cross-sectional. For adolescent anxiety, shame may be particularly important. Future intervention work can examine effects of targeting shame among adolescents with high neuroticism and/or anxiety.

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1. Introduction

Among adolescents, anxiety disorders are the most common psychological problems (Kessler et al., 2012). Adolescent anxiety persists, predicting later symptomatology in adulthood (Olin, Klein, Lewinsohn, Rohde, & Seeley, 2010). One underlying factor that is strongly associated with anxiety is neuroticism (for review, see; Kotov, Gamez, Schmidt, & Watson, 2010), a personality factor that corresponds to and predisposes individuals to experience negative affect (Watson, Clark, & Tellegen, 1988). Neuroticism has been reliably studied among youth (Hink et al., 2013), with studies demonstrating continuity between youth and adult neuroticism (Caspi & Roberts, 2001). Neuroticism, though, is a broad factor implicated in the etiology of many other forms of psychopathology (e.g., Widiger, Verheul, & van den Brink, 2009). Thus, additional, more specific, risk factors should be identified and examined. The notion of considering both general and specific risk factors is in line with Barlow's (2004) triple vulnerability model, which states that the development of anxiety results from general genetic, general psychological, and disorder-specific (or semi-specific e.g., Taylor, 1998) factors.

Shame has been described as a risk factor for the development of psychological symptoms such as anxiety (e.g., Lewis, 1971), though, until recently, empirical studies have been limited due to lack of reliable measures of shame (Rizvi, 2010). Shame has been labeled as a self-conscious emotion that emerges when flaws of the self are revealed to others (Dearing, Stuewig, & Tangney, 2005). It is associated with a range of emotional disorders (Tantam, 1998), correlating significantly with neuroticism (Woien, Heidi, Patock-Peckham, & Nagoshi, 2003) and anxiety (Fergus, Valentiner, McGrath, & Jencius, 2010) in adults. However, there is a dearth of research examining such associations among adolescents. Developmentally, this is a crucial period of study as it has been suggested that, although shame is present earlier in childhood, levels of shame may increase during adolescence (Reimer, 1996) and take on maladaptive forms (Szentágotai-Táti et al., 2015). To date, no study has evaluated shame as a potential explanatory factor underlying the association of neuroticism and anxiety among any age group.

In addition to shame, psychological flexibility is another relevant factor to consider with regard to neuroticism and anxiety. It is a broad term conceptualized as an "ability to contact the present moment" and "to change or persist in behavior when doing so serves valued ends" (Hayes, Luoma, Bond, Masuda, & Lillis, 2006). Deficits in exhibiting psychological flexibility (psychological inflexibility) has been associated with higher rates of anxiety in adults and children, and is considered a risk factor for the development of a range of mental health issues

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(Fergus et al., 2012). Psychological inflexibility is associated with neuroticism (Latzman & Masuda, 2013), and is a significant predictor of anxiety (Boelen & Reijntjes, 2008), over and above neuroticism.

One additional variable of interest is emotion regulation. Emotion regulation is a broad term, whose definition is contentiously discussed (Bloch, Moran, & Kring, 2010). Generally, emotion regulation encompasses processes that influence expression of emotional responses that are developed over time (Gross, 2014). The inability to appropriately regulate emotion has been described as emotion dysregulation (Bloch et al., 2010) and is considered to be transdiagnostic, common to many forms of psychopathology (Werner & Gross, 2010). Further, measures of the construct explain additional variance in anxiety symptoms, not accounted for by other general factors (Cisler, Olatunji, Feldner, & Forsyth, 2009), though it has not been examined as a mechanism underlying the link between neuroticism and anxiety.

The current study explored the relationship of three factors (shame, psychological inflexibility, and emotion dysregulation) as potential mechanisms underlying the association between neuroticism and anxiety (see Fig. 1), with multiple indices of anxiety as an outcome. Importantly, these three factors have been widely considered to be transdiagnostic (i.e., cutting across diagnostic categories) though we are unaware of any published research examining their associations with anxiety in the same model/study. While evaluating such factors in isolation may help to identify features associated with psychopathology, it says little about the utility of constructs over and above other established ones. This study aimed to concurrently evaluate these three, well-established, factors to determine statistical significance over and above effects of one another. Moreover, to date, no study has evaluated these factors, individually, or concurrently, as indirect explanatory variables underlying the link between neuroticism and anxiety in adolescents. We hypothesized that each of these three factors would represent distinct, though related, constructs and that each factor would, uniquely, explain the association between neuroticism and anxiety, over and above their shared variance.

2. Method

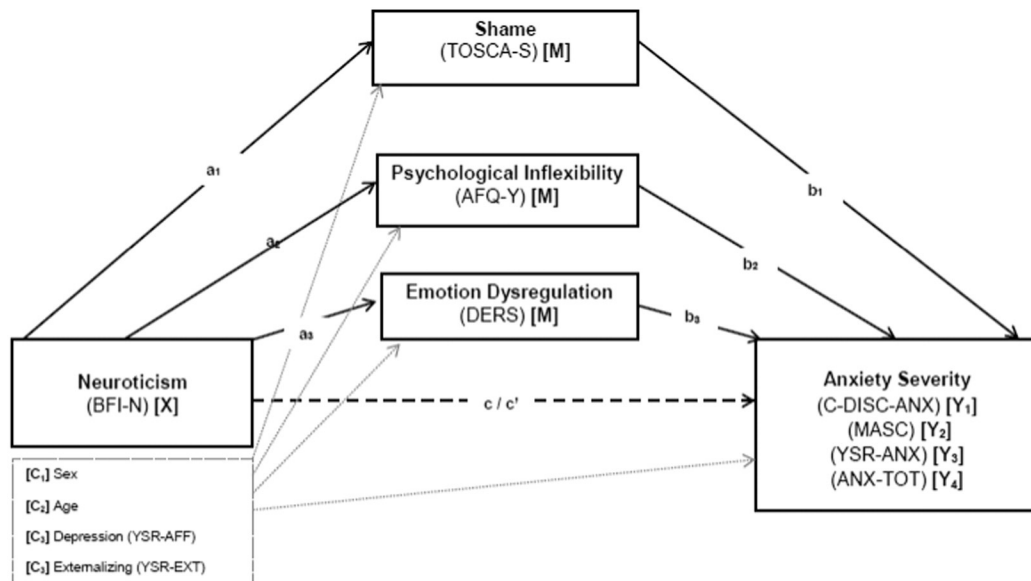
Data from 97 adolescents were available for the current study, collected as part of a larger research study evaluating emotions among

inpatient youth. The current data were collected from 2012 to 2015. Participants were recruited from an inpatient psychiatric unit that serves individuals with severe behavioral and emotional disorders who have not responded to previous interventions. Length of stay ranged from 15 to 86 days ($M = 37.81$, $SD = 12.45$). Inclusion criteria was sufficient proficiency in English to consent to research and complete the necessary assessments, and exclusion criteria were a diagnosis of schizophrenia or another psychotic disorder, an autism spectrum diagnosis, or an IQ of less than 70. 185 consecutive admissions to the hospital were approached for consent, 16 declined participation, 1 revoked consent, and 16 were excluded on the basis of the aforementioned criteria. Additionally, 55 participants were excluded due to missing data on one or more measures of interest. Therefore, the final sample consisted of 97 adolescents (ages 12–17; $Mage = 15.23$; $SD = 1.43$), including 63.9% females, and had the following ethnic breakdown: 77.3% White, 7.2% Hispanic, 2.1% Asian, and 13.4% mixed or other. Based on DSM-IV criteria, 74.4% were diagnosed with major depressive disorder, 26.7% ADHD, 26.7% social phobia, 28.9% obsessive compulsive disorder, 23.3% generalized anxiety disorder, 16.7% oppositional defiant disorder, 17.8% panic disorder, 14.4% agoraphobia, 15.6% separation anxiety disorder, 9% anorexia, 8.9% post-traumatic stress disorder, 2.2% bulimia, 15.6% conduct disorder, and 4.4% bipolar at admission. Additionally, 74.2% self-endorsed anxiety as a reason for their hospitalization.

The study was approved by the appropriate institutional review board. All adolescents admitted to an inpatient psychiatric unit were approached on the day of admission about participation. Informed consent was provided by parents first, and if granted, assent from adolescents was obtained. Adolescents were collectively assessed by doctoral-level clinical psychology students and/or trained clinical research assistants. The assessments were conducted independently and in private within the first two weeks following admission.

2.1. The computerized diagnostic interview schedule for children (C-DISC)

The C-DISC (Shaffer, Fisher, Lucas, Dulcan, & Schwab-Stone, 2000) is a structured computer-assisted diagnostic interview used to assess DSM-IV Axis I psychiatric disorders in children and adolescents. The number of symptoms for each anxiety disorder that were endorsed on



Note: a_i = Effect of X on M_i ; b_i = Effect of M_i on Y_i ; c = Total effect of X on Y_i ; c' = Direct effect of X on Y_i controlling for M_i . Sex, age, depression, and externalizing are covariates.

Fig. 1. Proposed model.

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