



## Borderline personality features, interpersonal correlates, and blood pressure response to social stressors: Implications for cardiovascular risk



Jeremy L. Grove<sup>a,\*</sup>, Timothy W. Smith<sup>a</sup>, Sheila E. Crowell<sup>a</sup>, Paula G. Williams<sup>a</sup>, Kevin D. Jordan<sup>b</sup>

<sup>a</sup> University of Utah, United States

<sup>b</sup> Indiana State University, United States

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### ABSTRACT

Borderline personality disorder (BPD) confers risk for cardiovascular disease (CVD). The present study used the interpersonal perspective to investigate potential mechanisms underlying this association. In two undergraduate samples ( $N = 293$ ;  $N = 188$ ) in Study 1, we replicated and extended research by demonstrating that BPD features were associated with hostile and somewhat submissive interpersonal behavior. Further, BPD features were associated with low social support and high levels of interpersonal conflict, two well-established risk factors for CVD. Also, hostile-submissive behavior contributed to the association of BPD features with low social support. In Study 2, we examined associations of BPD features with blood pressure (BP) responses to two interpersonal stressors implicated in models of the effects of stress on CVD, specifically by using laboratory tasks involving interpersonal conflict and evaluative threat in a third undergraduate sample ( $N = 143$ ). BPD features predicted elevated BP reactivity to conflict but not evaluative threat, and such heightened reactivity previously has been found to predict the development of CVD. The interpersonal perspective may be useful for investigating mechanisms linking BPD to CVD risk, and processes that undermine otherwise protective social support or heighten exposure and reactivity to interpersonal conflict may be relevant in this regard.

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### 1. Introduction

Personality traits such as negative affectivity and antagonism predict the development of cardiovascular disease (CVD) (Chida & Steptoe, 2009; Smith, Baron, & Grove, 2014; Smith, Glazer, Ruiz, & Gallo, 2004; Suls & Bunde, 2005). Most research examines normal personality, but personality disorders also predict health outcomes, including CVD (Björkenstam, Björkenstam, Holm, Gerdin, & Ekselius, 2015; El-Gabalawy, Katz, & Sareen, 2010; Grant et al., 2008). Current models emphasize continuity between normal personality and personality pathology (Widiger, 2011), suggesting that personality disorders are best understood as extremes of social and emotional tendencies rather than discrete classes (Samuel, Carroll, Rounsaville, & Ball, 2013). Thus, personality risk factors for CVD could be conceptualized along a continuum, with perhaps the greatest risk being associated with personality disorders.

Some evidence suggests that borderline personality disorder (BPD) is a risk factor for physical illness, including CVD (El-Gabalawy et al., 2010; Lee et al., 2010; Moran et al., 2007). BPD is a severe and pervasive disorder marked by multiple problematic characteristics, several of

which could contribute to elevated risk for CVD. For example, borderline personality features such as impulsivity predict obesity (Powers & Oltmanns, 2013), a well-established risk factor for CVD (Bastien, Poirier, Lemieux, & Després, 2014). However, despite the growing interest in the health consequences of BPD, possible psychosocial mechanisms in the association of BPD with CVD are not well-studied.

In models of psychosocial risk for CVD, individual-level characteristics such as personality traits and disorders are believed to influence pathophysiology through recurrent stress processes, specifically through 1) heightened exposure to stressors (e.g., interpersonal conflict) and reduced levels of protective experiences and resources (e.g., social support), 2) excessive psychophysiological reactivity to stressors and reduced physiologic benefit from protective experiences when they do occur, 3) delayed physiologic recovery from episodes of stress, and 4) poor restoration of physiological functioning (Williams, Smith, Gunn, & Uchino, 2010). Notably, BPD has been linked with heightened stress exposure and reduced levels of protective factors, in the form of related interpersonal difficulties (Ross & Babcock, 2009; Whisman & Schonbrun, 2009). Further, BPD is associated with difficulties regulating intense negative emotions (Gratz, Rosenthal, Tull, Lejuez, & Gunderson, 2006) and, although findings are somewhat mixed, research suggests BPD may also be related to heightened physiological reactivity to stressors (Austin Riniolo, & Porges, 2007; Cavazzi & Becerra, 2014; Ebner-Priemer et al., 2007). Finally, poor sleep quality is common

\* Corresponding author at: Department of Psychology, University of Utah, 380 South 1530 East (room 502), Salt Lake City, UT 84112-0251, United States.  
E-mail address: [Jeremy.grove@psych.utah.edu](mailto:Jeremy.grove@psych.utah.edu) (J.L. Grove).

among individuals with BPD (Grove, Smith, Crowell, & Ellis, 2016; Selby, 2013), and disruption of this key restorative process increases risk for CVD (King et al., 2008).

### 1.1. The interpersonal perspective on psychosocial risk for cardiovascular disease

The interpersonal perspective in personality, clinical and social psychology (Horowitz & Strack, 2011; Pincus & Ansell, 2013) provides an integrative framework for the study of psychosocial risk for CVD (Smith & Cundiff, 2011; Smith et al., 2004, 2014). In this model, aspects of the individual (e.g., trait negative emotionality) and the social environment (e.g., isolation, low support, interpersonal conflict) are not separate classes of influences on CVD, but instead are related through interpersonal processes that confer risk (Gallo & Smith, 1999). Specifically, in this view individuals influence – and are influenced by – their social contexts through transactional processes. An individual's internal processes (e.g. affect, appraisals, motives) influence his or her overt interpersonal behavior (e.g. hostility, warmth), which in turn constrains the reactions of interaction partners. Over time, these responses from others tend to maintain the initial actor's internal experience and overt behavior, and foster stable patterns of interpersonal experiences and relationships. In the case of personality risk factors for CVD (e.g., negative affectivity, antagonism), these transactional processes result in recurring patterns of adverse interpersonal experience (i.e., high conflict, low support) and physiological responses to those experiences that over time hasten the progression of CVD through the stress mechanisms described previously (Smith et al., 2014).

In interpersonal theory, these patterns are described in the interpersonal circumplex (IPC) (Horowitz et al., 2006; Pincus & Ansell, 2013; Wiggins, 1979), comprising two orthogonal dimensions of affiliation (e.g. warmth vs. hostility) and control (dominance vs. submissiveness). The IPC describes momentary behavior, but also more enduring characteristics, such as personality traits and aspects of social context (Gurtman, 1992). The complementarity principle – a central tenet of interpersonal theory – states that an individual's interpersonal behavior invites responses from others that are similar in affiliation but opposite in control (Pincus & Ansell, 2013). Related research supports this prediction for affiliation (i.e., warmth evokes warmth in return; hostility evokes hostile responses), but dominant behavior is often met with dominance in return, rather than the predicted submissiveness (e.g., Cundiff, Smith, Butner, Critchfield, & Nealey-Moore, 2015). Thus, this framework provides a common description of risk factors that emphasize aspects of the individual (e.g., personality traits, emotional adjustment), the social context, and associations between these domains (Gallo & Smith, 1999; Smith et al., 2014).

Interpersonal traits or behavioral styles associated with psychosocial risk factors can be determined by their associations with IPC-based measures of personality (Gurtman, 1992), and the complementarity principle then provides a prediction regarding related interpersonal experiences. For example, psychosocial characteristics associated with a hostile interpersonal style would be expected to be associated with low levels of social support and high levels of conflict (Gallo & Smith, 1999; Gallo, Smith, & Ruiz, 2003). These recurring interpersonal processes, in turn, can influence CVD through stress responses (i.e. heightened exposure and reactivity, and impaired recovery and restoration) (Smith et al., 2014, 2004).

The interpersonal perspective is clearly applicable to examining BPD as a CVD risk factor. Individuals with BPD display several maladaptive internal processes, including negative affect, emotion dysregulation, appraisals of others as hostile, and poor inhibition of angry impulses (Gratz et al., 2006; Linehan, 1993; Sadikaj, Moskowitz, Russell, Zuroff, & Paris, 2013). These processes promote problematic overt interpersonal behavior common among these individuals, such as hostility toward others and conflict escalation (Crowell, Beauchaine, & Linehan, 2009; Gunderson, 2007). Through the transactional processes described

previously, these patterns likely reduce social support and increase exposure to interpersonal conflict. The effects of these stress exposures may be particularly unhealthy if BPD is also associated with excessive physiological responses to such stressors, resulting in greater cumulative physiological activation.

The present studies are an initial attempt to apply this perspective on psychosocial risk for CVD to BPD. The objective of Study 1 was to replicate prior research using the IPC to describe the interpersonal style associated with BPD (e.g., Pincus & Wiggins, 1990; Wright et al., 2013), and to examine the relation between BPD features and interpersonal processes associated with CVD. That is, Study 1 examined exposure to interpersonal sources of risk (i.e., high conflict and low social support). In Study 2 we examined associations between BPD features and stress reactivity, specifically cardiovascular responses to social stressors. Notably, our samples are comprised of young adult undergraduate students, a population that is decades younger than the typical age for the clinical appearance of CVD. However, the atherosclerotic process underlying CVD begins as early as later childhood and adolescence (McGill, McMahan, & Gidding, 2008). Further, psychosocial risk factors and cardiovascular reactivity in young adulthood predict progression of this disease process and later manifestations of CVD (Chida & Steptoe, 2010; Smith & Cundiff, 2011). Thus, examination psychosocial and psychophysiological processes in this age range is relevant in efforts to explicate associations of BPD symptoms with CVD risk.

## 2. Study 1: interpersonal style and consequences related to BPD

In studies using IPC assessments of interpersonal style, BPD is generally associated with low warmth or high hostility, although results are somewhat inconsistent, perhaps due to variability across subtypes of individuals with BPD or instability in their interpersonal behavior (Hopwood et al., 2009; Russell, Moskowitz, Zuroff, Sookman, & Paris, 2007; Sadikaj et al., 2013; Wright et al., 2012; Wright et al., 2013). BPD is sometimes associated with a more submissive style (Russell et al., 2007), but findings regarding this IPC dimension are inconsistent. BPD is a highly heterogeneous diagnosis (American Psychiatric Association, 2013), and interpersonal behavior in BPD may be largely dependent on the constellation of symptoms for a given person (Wright et al., 2013). Further, mean-level estimates of interpersonal style might not be representative of the actual interpersonal behavior in this population (Hopwood et al., 2009). Nonetheless, interpersonal style can be useful for describing general patterns of behavior that in turn predict specific outcomes (Pincus & Ansell, 2013), such as stress exposure and CVD (Smith et al., 2004, 2014).

To our knowledge, few studies have examined interpersonal style as a mechanism linking BPD symptoms to social outcomes related to CVD risk, such as low support and high conflict. Hence, this study sought to determine the interpersonal style associated with two measures of BPD symptoms, and test this style as a mechanism linking BPD symptoms to lower social support and higher interpersonal conflict. We hypothesized that: a) BPD symptoms would relate to a hostile-submissive interpersonal style, b) that BPD symptoms would be associated with lower social support and higher interpersonal conflict, and c) that these latter associations would involve indirect effects of interpersonal style.

### 2.1. Method

#### 2.1.1. Participants

Two samples of undergraduate students from a public university received course credit (Sample 1:  $N = 293$ , 65% Female; Sample 2:  $N = 188$ , 63% Female). Across both samples the mean age was approximately 23 years, and 70% of the participants identified as Caucasian, 11% Asian/Pacific Islander, and 7% Hispanic.

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