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Narcissism predicts heightened cortisol reactivity to a psychosocial stressor in men

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ABSTRACT

Narcissists' sensitivity to social evaluation should increase their physiological reactivity to evaluative stressors. However, very few studies have assessed the physiological correlates of narcissism. In this study, participants completed an evaluative laboratory stressor or a non-evaluative control task. Cortisol reactivity—a marker of the hypothalamic–pituitary–adrenal (HPA) axis stress response—and negative affect (NA) were higher in the stress versus control condition. However, men showed larger cortisol responses and, among men, higher narcissism scores predicted greater cortisol reactivity and larger increases in NA. Narcissism was unrelated to cortisol reactivity and NA among women and in the control condition. These findings highlight the influence of defensive personality traits on HPA reactivity and suggest a pathway through which narcissistic traits might influence long-term health outcomes.

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1. Introduction

Narcissism is characterized by arrogance, feelings of grandiosity, a sense of entitlement, lack of empathy, and interpersonally exploitive behavior (Emmons, 1987; Raskin & Hall, 1979). Narcissistic individuals view themselves more favorably than they are viewed by others (e.g., John & Robins, 1994), especially in agentic domains (Paulhus & John, 1998). They overestimate their intelligence, attractiveness, and competence (Gabriel, Critelli, & Ee, 1994; Paulhus & John, 1998), and they are motivated by opportunities to reinforce their overly positive self-images (Morf, Weir, & Davidov, 2000; Wallace & Baumeister, 2002). Indeed, many aspects of narcissistic behavior can be characterized as defensive attempts to maintain an unrealistically positive self-view (Morf & Rhodewalt, 2001): Narcissists seek admiration rather than intimacy in close relationships (Campbell, 1999), they respond aggressively to negative feedback (e.g., Bushman & Baumeister, 1998), and they show positively biased recall of past events following interpersonal rejection (Rhodewalt & Eddings, 2002).

Although these strategies may serve some self-protective functions, they can nevertheless prove costly in other domains. For instance, the positive initial impressions that narcissists make on others tend to diminish over time (Paulhus, 1998), and narcissists' romantic relationships are generally characterized by lower levels of commitment and satisfaction (Foster, 2008). Chronic reliance on defensive strategies has also been associated with adverse physiological and health consequences (e.g., Rutledge, 2006); however, very little is currently known about the physiological implications of narcissism. In the present study, we examined a physiological system that should be particularly relevant to narcissism—the hypothalamic–pituitary–adrenal (HPA) axis. The HPA axis is one of the body's most important stress-response systems, and HPA reactivity is strongly influenced by threat of social evaluation (Dickerson & Kemeny, 2004), a psychological state that should be especially salient for narcissists. Moreover, because chronic dysregulation of the HPA axis has been associated with poor mental and physical health (e.g., Chrousos & Gold, 1992; McEwen, 2003), HPA reactivity may provide a link between narcissism and long-term health outcomes.[1]

The goal of the present study was to examine the influence of narcissism on physiological and psychological stress responses. Participants completed a modified version of the Trier Social Stress Test (TSST; Kirschbaum, Pirke, & Hellhammer, 1993; Yim, Quas, Cahill, & Hayakawa, 2010), an evaluative laboratory stressor that has been shown to elicit HPA reactivity, or a non-evaluative control task. Changes in salivary cortisol, a marker of HPA reactivity, and self-reported mood were assessed following the laboratory stressor or control task. We expected the TSST to be especially stressful for narcissistic individuals because it elicits a strong threat of social evaluation (Dickerson & Kemeny, 2004) and should be threatening

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[1] Narcissism can be observed both at clinical levels, reflecting personality disorder (American Psychiatric Association, 1994), and at sub-clinical levels, reflecting a normally distributed personality characteristic (Raskin & Hall, 1979). In our research and in the studies reviewed here, narcissism is assessed as a sub-clinical personality construct.

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specifically to characteristics that narcissists value, namely their sense of competence and agency (Paulhus & John, 1998).

1.1. The role of narcissism in physiological responses to social evaluation

In numerous studies, the TSST has been shown to elicit increases in both cortisol and reports of negative emotion (e.g., Dickerson & Kemeny, 2004; Kudielka, Schommer, Hellhammer, & Kirschbaum, 2004). Moreover, participants who report experiencing more negative emotions, particularly self-conscious negative emotions (e.g., shame, embarrassment), tend to show larger cortisol responses (e.g., Gruenewald, Kemeny, Aziz, & Fahey, 2004). Cortisol responses appear to be closely tied to the evaluative component of the TSST, as such responses are not observed when the task is performed without observers or when observers do not play an explicitly evaluative role (Dickerson, Mycek, & Zaldivar, 2008).

These findings suggest that participants who are particularly sensitive to social evaluation and prone to experience self-conscious emotions would show the largest cortisol responses to the TSST. In the current study, we investigated this idea by examining the influence of narcissism, a personality construct associated with extreme self-focus and need for admiration (Campbell, 1999; Emmons, 1984), on cortisol reactivity. Narcissists are especially sensitive to evaluation by others (Twenge & Campbell, 2003), particularly likely to experience shame (Tracy & Robins, 2004; P. J. Watson, Hickman, & Morris, 1996), and highly reactive to shame-inducing experiences (Thomaes, Bushman, Stegge, & Olthof, 2008), all of which should predict greater cortisol reactivity to evaluative stressors such as the TSST (Gruenewald et al., 2004).

To our knowledge, prior work on narcissism has not assessed HPA responses to psychosocial stressors, although there is some evidence linking narcissism with heightened cardiovascular reactivity, a measure of the autonomic nervous system (ANS) stress response. For instance, one study of men found that higher scores on the Narcissistic Personality Inventory (NPI), the most widely used measure of sub-clinical narcissism, predicted greater cardiovascular reactivity during anticipation of aversive stimuli (Kelsey, Ornduff, McCann, & Reiff, 2001). A more recent study examined changes in heart rate and blood pressure while participants imagined rejection or acceptance scenarios (Sommer, Kirkland, Newman, Estrella, & Andreassi, 2009). In this study, NPI scores predicted *lower* cardiovascular responses across tasks, whereas another measure of narcissism predicted greater cardiovascular reactivity only during the rejection scenarios. Although these findings provide some evidence that narcissists experience greater physiological arousal during stressful tasks, there is some inconsistency across tasks and measures, which may be due, in part, to the focus on the ANS stress response. ANS responses, such as cardiovascular reactivity, are elicited by psychosocial stressors, but such responses are less sensitive to the evaluative component of these stressors per se (Gruenewald et al., 2004; Schwabe, Haddad, & Schachinger, 2008). ANS responses may also be responsive to other, potentially confounding variables such as task engagement and effort (Peters et al., 1998). As Sommer et al. argue, work in this area may benefit from focusing specifically on the HPA stress response, which is more sensitive to evaluative threat.

To summarize, extant research on narcissism has not examined HPA reactivity to psychosocial stressors, which should be particularly relevant to narcissistic concerns and goals. In the present study, we expected that individuals with higher narcissism scores would show a larger cortisol response following a socially evaluative laboratory stressor, and that the relation between narcissism and cortisol reactivity would not be observed following the non-evaluative control task.

1.2. Additional considerations

Because laboratory stressors such as the TSST have been shown to increase the experience of negative emotion (e.g., Federenko, Nagamine, Hellhammer, Wadhwa, & Wust, 2004), we also assessed participants' subjective emotional responses to the experimental tasks. Insofar as narcissists experience greater distress during such stressors, we expected to see increases in both self-reported negative emotion and cortisol reactivity. However, there is also evidence for dissociations between self-reported negative emotion and cortisol responses to stressful experiences (Abelson, Liberzon, Young, & Khan, 2005; Dickerson & Kemeny, 2004), suggesting that the two kinds of responses are not necessarily isomorphic. That is, participants who report high levels of negative emotion may not necessarily show the largest cortisol responses. Self-enhancement biases, which are particularly likely among narcissists (e.g., John & Robins, 1994), may also distort self-reports of negative emotion. Therefore, in the present study, we were particularly interested in the extent to which narcissism might differentially influence psychological and physiological stress responses.

Finally, it is important to consider the role of gender in responses to psychosocial stressors such as the TSST. Men typically show larger increases in cortisol compared to women (see Kudielka & Kirschbaum, 2005) and, although gender differences in narcissism are typically small, men often score higher than women on measures such as the NPI (e.g., Foster, Campbell, & Twenge, 2003). Thus, to the extent that both narcissism scores and cortisol responses are higher among men, failing to account for gender could inflate the overall relation between narcissism and cortisol reactivity.

2. Method

2.1. Participants

Participants were 90 undergraduate students (51% female; *M* age = 20.57, *SD* = 2.91) who received either course extra-credit or monetary compensation for their participation. Thirty-four percent of participants identified as Caucasian, 33% as Asian–American, 12% as Hispanic, 10% as multiethnic, and 11% as of other ethnicities. Individuals with chronic health conditions and smokers were excluded, as these factors are known to influence cortisol reactivity. In addition, because cortisol reactivity varies according to menstrual cycle phase (Kirschbaum, Kudielka, Gaab, Schommer, & Hellhammer, 1999), and a portion of this study involved collecting saliva samples at a later date (see Quas, Yim, Edelstein, Cahill, & Rush, submitted for publication), only women on oral contraceptives were included. All procedures were approved by the University of California, Irvine, Institutional Review Board.

2.2. Procedure

All participants were tested individually in sessions beginning between 1 pm and 4 pm to control for diurnal variation in cortisol levels. After informed consent was obtained, participants completed a series of background questionnaires, including measures of their current mood. The first baseline saliva sample was obtained after a 20-min adaptation period. Next, participants completed one of two laboratory tasks: a slightly modified version of the Trier Social Stress Test (TSST-M; see below and Yim et al. (2010) for additional details) or a non-evaluative control task.

Participants who completed the TSST-M were videotaped while giving a speech and performing a mental arithmetic task in front of two observers (one male, one female). As is standard in the TSST, the observers were instructed to behave in an emotionally neutral