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Self-affirmation facilitates cardiovascular recovery following interpersonal evaluation

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ABSTRACT

Self-affirmation is known to reduce defensive psychological responses to ego threats. The current experiment tested the hypothesis that self-affirmation reduces physiological responses to a form of ego threat—interpersonal evaluation. Participants wrote an essay and received either neutral or insulting evaluative feedback about their essay, ostensibly from another participant. Then participants wrote about a core personal value (self-affirmation) or about a less important value (no self-affirmation). Lastly, participants played a competitive reaction time game that permitted them to blast their purported evaluator with noise. Noise blasts did not vary across conditions, but mean arterial blood pressure increased in response to being evaluated and returned to baseline more quickly following self-affirmation. Further, insulting (versus neutral) evaluative feedback caused a greater increase in heart rate, except among those who self-affirmed following the evaluation manipulation. These results suggest that self-affirmation facilitates the return to baseline cardiovascular activity following interpersonal evaluation.

1. Introduction

Evolutionary processes have honed physiological responses to danger to a fine point. Threatening stimuli elicit sympathetic nervous system responses including increased skin conductance (e.g., Flykt, Esteves, & Öhman, 2007; Williams et al., 2001) and cardiovascular activity (Light & Obrist, 1980; Svebak, 1982). Threatening stimuli can also induce large-scale somatic responses such as freezing (e.g., Roelofs, Hagenaars, & Stins, 2010), or if the threat comes suddenly, a defensive startle reflex (Lang, 1995; Lang & Bradley, 2010). In the context of confronting a predator, such responses can prepare the body to act quickly.

Psychological threats also elicit defensive physiological responses. For example, social-evaluative threats (i.e., threats that arise when an important aspect of one's identity is or could be negatively evaluated) evoke a stress response, particularly when the social evaluative threat is perceived to be uncontrollable. According to *social self-preservation theory*, humans are motivated to protect the social self, and this motivation is supported by activity in the hypothalamic–pituitary–adrenocortical (HPA) axis (Dickerson & Kemeny, 2004). Cortisol produced by HPA activity triggers vasoconstriction, which increases heart rate and can help to mobilize an energetic response to the psychological threat. However, staying relatively calm by down-regulating the physiological response to social-evaluative threat may be beneficial, insofar as persistent elevated cardiovascular activity has been associated with increased risk for cardiovascular disease (Chida & Steptoe, 2010). According to the World Health Organization, cardiovascular diseases are the leading cause of deaths globally (over 17 million deaths per year); viewed in this grim light, interventions that reduce cardiovascular reactivity or facilitate recovery from stress may have beneficial implications for health. The primary purpose of the current experiment was to test the hypothesis that a common social psychological intervention—self-affirmation—helps to alleviate defensive cardiovascular activation triggered by social-evaluative threat.

2. The threat of being evaluated

Numerous studies have observed that being evaluated by others elicits defensive physiological responding. For example, a recent daily sampling study asked married and working couples to report on their activities and feelings and also assessed their cardiovascular activity at random intervals during the day. Feelings of social-evaluative threat were associated with increased blood pressure (Smith, Birmingham, & Uchino, 2012).

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In addition to correlational evidence linking naturally occurring social threats to increased cardiovascular activity, experimental evidence supports a causal relationship. For instance, one experiment had participants complete the Trier Social Stress Test (TSST), which involves preparing and delivering a speech to be evaluated by others (Smith, Nealey, Kircher, & Limon, 1997). In one condition participants were told that their speech would be evaluated on word clarity—an aspect of the task that revealed little information about the self; this was the low evaluative threat condition. In the other condition, participants were told their speech would be evaluated on its effectiveness and how easy it was to understand—aspects of the speech that are more likely to implicate the self and its abilities; this was the high evaluative threat condition. The results revealed an increase in blood pressure from the preparation to the speech delivery phase of the study and higher overall blood pressure levels among participants under greater evaluative threat.

Although social evaluations may be threatening particularly when they reveal negative or unwanted information about the self, research suggests that harsh evaluations are not necessary to produce a defensive physiological response. Evaluation alone appears to be enough to elicit increased cardiovascular activity, possibly by increasing how much persons ruminate or worry about the outcome (e.g., Brosschot, Gerin, & Thayer, 2006). Taylor et al. (2010) had participants complete the TSST in either a positive or a negative evaluation condition, or in a condition wherein no evaluation occurred. In the positive and negative evaluation conditions, the evaluators expressed nonverbal signals of interest and approval or boredom and frustration, respectively. Participants who were evaluated (positively or negatively) showed elevated cortisol, heart rate, and blood pressure levels compared to participants in the no evaluation control condition. In fact, participants in the positive evaluation condition exhibited slightly greater cortisol and blood pressure levels than those in the negative evaluation condition, but these differences fell short of conventional levels of statistical significance.

3. Provocation, anger, and cardiovascular responses

Previous research has thus observed that a physiological stress response occurs with the mere possibility of being evaluated. Does an explicitly harsh evaluation produce an even larger response? Research on anger suggests that it does. Being insulted by another person may be the epitome of negative social evaluation, and insults have long been observed to elicit anger and physiological arousal. For example, one study compared cardiovascular activity among participants completing the TSST under supportive, neutral, and provoking conditions. The results revealed that anger-provoking prompts from the experimenter caused greater increases in blood pressure and heart rate, compared to neutral and supportive prompts (Gallo, Smith, & Kircher, 2000). Another study found that criticisms from an irritated experimenter caused an increase in mean arterial blood pressure (Mauss, Evers, Wilhelm, & Gross, 2006). Indeed, many studies have successfully used interpersonal provocation or insult to induce changes in cardiovascular activity (e.g., Anderson, Linden, & Habra, 2005; Ax, 1953; Pedersen et al., 2011).

In the current experiment we measured cardiovascular activity before and after participants received either neutral or explicitly insulting evaluative feedback. We expected to find increases in cardiovascular activity in both conditions, consistent with evidence that being evaluated evokes a stress or threat-related response (e.g., Smith et al., 1997). Further, we expected that the increase in cardiovascular activity would be larger in the insulting feedback condition relative to the neutral feedback condition, as suggested by prior research on anger (e.g., Gallo et al., 2000). More novel was the prediction that evaluation-related and insult-related increases in cardiovascular responding would be reduced by simply reflecting on one's core values after being evaluated.

4. Self-affirmation

Identifying one's core values in life and expressing why these values are personally important is a form of self-affirmation that bolsters the perceived adequacy and integrity of the self (Steele, 1988). Numerous experiments have observed that affirming the self reduces defensive responding to self-threats (Steele, 1988; for a review, see Sherman & Cohen, 2002). For example, one study examined the effects of viewing graphic health warning labels on smokers. Smokers who self-affirmed were more accepting of information about the health risks of smoking and were more motivated to reduce their smoking habits relative to non-affirmed smokers (Harris, Mayle, Mabbott, & Napper, 2007). Likewise, reminding people of their own mortality has been found to induce a host of defensive reactions including outgroup derogation and worldview defense, but individuals who affirm their core values before a death reminder exhibit less worldview defense and death-thought accessibility relative to non-affirmed individuals (Schmeichel & Martens, 2005). These findings and several others have indicated that self-affirmation reduces defensive psychological responses to various forms of self-threat. Self-affirmation has also been found to reduce ruminative thoughts (Koole, Smeets, Van Knippenberg, & Dijksterhuis, 1999)—the types of thoughts that may exacerbate cardiovascular reactivity to self-threats.

Whereas numerous studies have documented that self-affirmation reduces psychological forms of self-defense (see Harris & Epton, 2009; McQueen & Klein, 2006), relatively little experimental evidence exists regarding the effects of affirmation on physiological responses to self-threats. One study found that self-affirmation reduces the cortisol response but not cardiovascular responses to the TSST (Creswell et al., 2005). Another study found that self-affirmation prevents increases in epinephrine and norepinephrine levels in urine (indicators of sympathetic nervous system activity) prior to a stressful academic examination (Sherman, Bunyan, Creswell, & Jaremka, 2009). The current experiment tested the hypothesis that self-affirmation reduces defensive physiological responding to self-threat by assessing cardiovascular responses to social evaluation and interpersonal insult.

4.1. The current study

Participants in the current experiment received either an insulting evaluation or a neutral evaluation from an ostensible peer. Following previous research (e.g., Gallo et al., 2000), we predicted that both neutral and insulting evaluations would increase cardiovascular activity, and that insulted participants would exhibit relatively greater increases. Furthermore, consistent with self-affirmation theory (Steele, 1988), we predicted that thinking and writing about a core personal value after being evaluated would facilitate cardiovascular recovery.

We quantified cardiovascular activity as mean arterial pressure (MAP) and heart rate (HR). MAP refers to average arterial blood pressure during the cardiac cycle and has commonly been used to assess responses to social (Seta & Seta, 1992) and cognitive (Ring, Burns, & Carroll, 2002) stressors. MAP has been found to increase when anticipating or experiencing a stressor and to remain temporarily elevated afterward (Westmaas & Jamner, 2006). HR is also commonly measured in response to stressors, and often rises along with blood pressure under stressful situations (e.g., Creswell et al., 2005). However, it may fall to baseline quicker than blood pressure,