

Hostility, emotional expression, and hemodynamic responses to laboratory stressors: Reactivity attenuating effects of a tendency to express emotion interpersonally

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Abstract

The present study examined the interactive effects of hostility and a predisposition towards emotional expression or suppression in interpersonal situations. We also attempted to partially replicate findings from a recent investigation which provided evidence of lower myocardial and greater vascular responses in high-hostile relative to low-hostile individuals. Undergraduate students ($n=99$) participated in a protocol consisting of rest periods, speech preparation and presentation, a social-evaluative mental arithmetic task, and a stress interview. After classifying participants into high/low hostility by high/low interpersonal emotional expression groups using median-splits, high-hostile individuals showed lower HR and SBP responses to speech preparation and reported greater threat appraisal and negative affect than low-hostile participants. High-hostile interpersonal expressors and male interpersonal expressors displayed lower DBP and TPR reactivity, respectively, than high-hostile or male suppressors. High-hostile expressors also reported lower levels of positive affect than high-hostile suppressors, and expressors reported lower threat appraisals than suppressors, irrespective of hostility. Findings are discussed in terms of an absence of conflict or ambivalence over interpersonal emotional expression for high-hostile expressors and are suggestive of potential health benefits of expressing emotion interpersonally for at-risk groups.

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1. Introduction

A considerable body of evidence supports an association between cynical hostility [assessed by the Cook-Medley Hostility Scale (Ho; Cook and Medley, 1954)] and an increased risk of coronary heart disease (CHD) (for reviews, see Miller et al., 1996; Smith, 1992). Cynical hostility, defined as “a set of negative attitudes, beliefs, and appraisals concerning others... [including]...a belief that others are generally unworthy and not to be trusted” (Smith, 1992, p. 139), has been described as an *interpersonal* risk factor (e.g., Smith and Gerin, 1998). In reviewing the relevant literature, Timothy Smith (1992) found

support for the idea that “[hostile] individuals...experience a more taxing interpersonal environment” (p. 145). According to Smith (1992), the “transactional model” of the hostility–health relationship assumes that hostile people are likely to appraise the behavior of others as indicative of “hostile intent” (p. 145) and “...to elicit and exacerbate conflict in their daily lives” (p. 145). Consistent with this view, recent research has found that individuals with high hostility appraised videotapes depicting ambiguous social interactions more negatively (Vranceanu et al., 2006). The idea that such interpersonal cynicism and hypersensitivity connotes risk is supported by evidence that stress-induced cardiovascular reactivity, a putative mechanism for the hostility-CHD link, is reliably associated with hostility in the laboratory only when social/interpersonal stressors are examined (for reviews, see Smith, 1992; Suls and Wan, 1993).

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Given their difficulty trusting others, the prospect of expressing emotions interpersonally might be especially daunting for some hostile individuals. Consistent with this notion, Christensen and Smith (1993) found an association between hostility and heightened blood pressure reactivity among men who were asked to disclose personal details to a stranger. However, while situational self-disclosure undoubtedly involves some degree of interpersonal emotional expression, participants' dispositional tendencies toward expressing versus suppressing their emotions interpersonally were not examined. This attribute could be particularly important in terms of disease relevance as it has been observed that hypertensive patients are characterized by internal conflict between the experience of hostility or anger and a desire to avoid expressing emotion to others (Alexander, 1939). Indeed, it is becoming increasingly evident that chronic emotional suppression carries risk for illness in its own right, whereas expression promotes well-being (e.g., for reviews, see Pennebaker, 1989, 1997; Scheier and Bridges, 1995). Thus, cynical hostility, along with a tendency to suppress emotion in interpersonal situations, in conjunction with life experiences that require the contrary, might be a particularly toxic combination. Conversely, the capacity to express emotion interpersonally might serve to buffer or ameliorate the potentially harmful effects of hostility.

Most research examining relationships between cardiovascular reactivity and emotional expression, alone or in conjunction with the experience of hostility, has focused on the expression of specific negative emotions, most notably, anger (for review, see Siegman, 1993). Although findings have been mixed (e.g., Bongard et al., 1998; Burns, 1995; Vögele et al., 1997), several investigations have found trait anger expression to be related to greater reactivity than suppression, but this relationship consistently emerges only when laboratory conditions are designed to intentionally induce anger (e.g., Siegman, 1993). Furthermore, in addition to emphasizing a single negative emotion, these studies often define anger expression using measures such as Spielberger's (1991) Anger-In and Anger-Out scales, which include items (e.g., "I do things like slam doors") that do not seem to tap *interpersonal* expression. Investigations not restricted to the study of anger have tended to examine situation-specific expression of primarily negative emotions (Mendes et al., 2003), rather than the dispositional tendency to express positive and negative emotions in general.

Individuals differ markedly in the extent to which their blood pressure responses to one or more stressors are driven primarily by increases in cardiac output (CO), total peripheral resistance (TPR), or both (Manuck et al., 1993) and these hemodynamic response patterns, known as myocardial, vascular, and mixed responses, respectively, may have differential pathophysiological implications (Obrist, 1981; Saab and Schneiderman, 1993). While longitudinal data are still needed, there is increasing evidence suggesting that vascular responses (Goldberg et al., 1996; Kapuku et al., 1999; Sherwood et al., 1999; Treiber et al., 1993) may be more maladaptive than myocardial responses (Heponiemi et al., 2007). Despite the apparent meaningfulness of interindividual variability in hemodynamic profiles, surprisingly few studies have attempted to relate hostility (with or

without anger expression/suppression) to CO or TPR reactivity. While Bongard et al. (1998) did not find evidence of such relationships, high-hostile anger expressors tended to show the least overall blood pressure reactivity, while low-hostile anger expressors tended to be most reactive. In a more recent investigation by Davis et al. (2000), high-hostile participants exhibited less heart rate (HR), systolic blood pressure (SBP), and CO reactivity and greater diastolic blood pressure (DBP) and TPR responses than their low-hostile counterparts.

Associations of psychosocial traits like hostility with cardiovascular responses may be due, in part, to stressor-related appraisals, emotions, and/or behaviors habitually experienced by people with the trait in question. In terms of appraisals, perhaps the best candidates in this regard are challenge and threat appraisals, which have been shown to precede myocardial and vascular/mixed responses to laboratory stressors, respectively (Tomaka et al., 1993, 1997). While data are remarkably lacking in this regard, it seems reasonable to predict that high-hostile individuals might be predisposed to appraise social/interpersonal stressors as more threatening than their low-hostile counterparts. This would seem to be particularly true of hostile people who are uncomfortable with expressing their emotions to others. For example, although Mendes et al. (2003; Study 2) conceptualized challenge and threat as situational emotional expression and suppression (to same-sex research assistants), respectively, as opposed to defining them in terms of appraisals, they observed cardiovascular sequelae commonly associated with the latter.

The present study was intended to partially replicate the findings of Davis et al. (2000) by examining hemodynamic responses to subtle social stressors as a function of hostility. We also sought to extend the existing literature by exploring the interactive effects of hostility and an index of interpersonal expressive style on hemodynamic responsiveness, appraisals, and state affect.

2. Method

2.1. Participants

Participants were 60 female and 39 male normotensive undergraduate students from a large, urban, state university, ranging in age from 17 to 48 years ($M=21.9$ yr). The sample consisted of 61 Caucasians, 23 African-Americans, and 15 individuals of other ethnicities. Students earned partial credit toward an undergraduate psychology course.

2.2. Procedure

Prior to the stress-reactivity session, participants were asked to refrain from caffeine, alcohol, and nicotine intake and strenuous exercise for 3 h before the appointment. Participants on cardioactive medications were asked to abstain; otherwise, they were either rescheduled for a later date at which they were medication-free or excluded from the study.

Upon arrival at the laboratory, participants' compliance with restrictions was verified and they filled out a preliminary set of

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