Cynical hostility influences anger, but not cardiovascular reactivity during competition with harassment

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Abstract

Cynical hostility has been linked to coronary heart disease (CHD), and there is mixed support for the hypothesis that cynical hostility may contribute to CHD through exaggerated cardiovascular responses to anger-provoking stressors. The present study tested the influences of cynical hostility on affective and cardiovascular responses to provocation in 68 undergraduate men. Subjects were divided into high and low cynical hostility groups by a median split on Cook-Medley Hostility Scale scores, and half of the subjects in each group were harassed during competition on a video game. High hostile subjects reported greater anger than low hostile subjects during the competition, independently of harassment, and harassment produced stronger feelings of mistreatment, independently of hostility. Harassed subjects experienced larger systolic blood pressure responses only during an affect rating period after the competition, but the responses were not influenced by hostility. These findings provide further evidence that cynical hostility, anger, and cardiovascular reactivity are not simply nor consistently related.

Keywords: Cynical hostility; Cardiovascular; Reactivity; Anger; Harassment

1. Introduction

There is inconsistent evidence that cynical hostility, assessed by the Cook-Medley Hostility Scale (Ho) (Cook and Medley, 1954), is a significant predictor of coronary heart disease (CHD). Several prospective studies (Barefoot et al., 1983; Barefoot et al., 1989; Shekelle et al., 1983) and a meta-analytic review (Matthews, 1988) found a positive relationship between cynical hostility and CHD morbidity or mortality, but three other longitudinal studies (Hearn et al., 1989; Leon et al., 1988; McCranie et al., 1986) found no such association. Cynical hostility was also related to the severity of coronary disease in one cross-sectional study (Williams et al., 1980), but was not associated with significant coronary artery disease in two other studies (Dembroski et al., 1985; Helmer et al., 1991). Thus, although evidence is equivocal, there is some support for a relationship between cynical hostility and cardiovascular disease (see Helmers et al. (1994) for a comprehensive review).

Even as the evidence for a link between cynical hostility and heart disease continues to be evaluated, studies of possible mechanisms for such
a relationship have been reported. The leading contenders are exaggerated neuroendocrine and cardiovascular reactivity to stressors; enhanced arousal could result from vigilance and anger as cynically hostile persons scan the environment for evidence of mistreatment (Williams et al., 1985). Cognitive and affective aspects of this proposed behavior have been reported. Compared to low hostile subjects, high hostile subjects reported more anger when harassed during an anagram solution task (Suarez and Williams, 1989), and reported greater anger and evaluated their competitors more negatively during a hostile, competitive reaction time task (Pope et al., 1990). Endocrine reactivity differences have also been reported; Pope and Smith (1991) found that high hostile subjects had higher urinary cortisol excretion during routine daily activities than low hostile subjects.

Studies of relationships between cynical hostility and cardiovascular reactivity have produced mixed findings; greater hostility was associated with greater reactivity in some studies (Christensen and Smith, 1993; Hardy and Smith, 1988; Smith and Allred, 1989; Suarez and Williams, 1989; Weidner et al., 1989), but not in others (Allred and Smith, 1991; Sallis et al., 1987; Smith and Houston, 1987). Cynical hostility failed to predict cardiovascular responses to mental arithmetic, the Stroop color-word task, or cold pressor stressors (Sallis et al., 1987; Smith and Houston, 1987), but these tasks were impersonal and may have failed to elicit feelings of anger. In contrast, cynical hostility generally predicted reactivity when subjects engaged in tasks that were interpersonally challenging or contained an anger provocation, such as harassment. In fact, Suarez and Williams (1989) found that anger mediated the effects of harassment during an anagram solution task on cardiovascular reactivity in hostile subjects. Suls and Wan (1993) suggested that reactivity may be greater in high than in low hostile subjects only during situations that cause greater anger in high than in low hostile subjects.

However, there were exceptions to this pattern. Greater cardiovascular reactivity has occurred in cynically hostile subjects in the absence of anger provocation, and has failed to occur in hostile subjects exposed to anger provocation. Weidner et al. (1989) reported that cynical hostility predicted cardiovascular reactivity during an anagram solution task with no anger provocation. The authors suggested that exaggerated cardiovascular reactivity in hostile subjects may have resulted from suspicion due to misleading task instructions; subjects were told that all anagrams could be solved, when in fact, only the first one was solvable. Christensen and Smith (1993) found greater cardiovascular reactivity in high than in low hostile subjects during harassment of a stressful personal event with no anger induction. In that study, hostility did not influence anxiety or anger, and only anxiety was higher in the disclosure than in the nondisclosure condition. Allred and Smith (1991) found that harassment during a discussion task did not result in cardiovascular reactivity differences between high and low hostile subjects even though the high hostile subjects rated their partners as more hostile and reported greater anger. The authors suggested that the anger manipulation may have produced greater task engagement in the low than in the high hostile subjects, which may have eliminated the expected influence of cynical hostility on reactivity. Thus, while an interpersonal interaction of some aversive nature generally seems required to elicit exaggerated cardiovascular reactivity in cynically hostile individuals, the findings are not consistent and the nature of that interaction is not fully clear.

The present study was designed to test the hypothesis that anger and cardiovascular reactivity would be greater in high than in low cynical hostile subjects in response to an interpersonal stressor with an anger provocation. We used the same video game task and harassment protocol that we found (Felsten and Leitten, 1993) to cause greater systolic blood pressure and heart rate reactivity in subjects with high than with low expressive hostility, a factor from the Buss-Durkee Hostility Inventory (Buss and Durkee, 1957) that also predicts risk of CHD (Siegman et al., 1987). Cardiovascular responses, self-report measures of affect, and evaluations of treatment by the competitor were obtained, and we predicted that: (1) high and low hostile subjects would not differ in
anger arousal, perceptions of treatment by the confederate, or cardiovascular responses to competition without harassment; (2) harassed subjects would report greater anger and perceived mistreatment, and have larger cardiovascular responses than non-harassed subjects; and (3) harassed, high hostile subjects would report greater anger and mistreatment, and have greater cardiovascular responses than harassed, low hostile subjects.

2. Method

Subjects and confederates

Subjects were 68 male undergraduate students; most were white and came from middle class families. Mean age was 20.2 years. All subjects provided informed consent and most received credit toward a research participation requirement for general psychology; a few received extra credit for other psychology courses. Subjects were assigned to low and high hostility groups by a median split on hostility scores, and half the subjects in each group were randomly assigned to the harassment condition.

Two male, undergraduate, directed research students served as confederates; they competed against subjects and harassed those assigned to the harassment condition during the competition. The confederates were well-practiced at pong and were not aware of the hostility scores of subjects; they never harassed subjects whom they knew.

Hostility assessment

All subjects completed pencil and paper versions of the Cook-Medley Hostility Scale (Ho; Cook and Medley, 1954) and a short health questionnaire in group sessions at least one week prior to participation in the laboratory. Subjects were classified into low and high hostility groups by a median split on hostility scores.

Procedures

Subjects were tested individually in the presence of a male confederate. They sat separated from each other and from the experimenter by a T-shaped partition. Only during the competition were subjects adjacent to and able to see each other. They were told the study investigated, "changes in blood pressure and heart rate that occur during various tasks.” Blood pressure cuffs were placed on the nondominant arm of the subject and of the confederate, who were then told to relax for 8 min while baseline blood pressure and heart rate measures could be recorded. At the conclusion of the baseline period, subjects were given instructions for competition on the video game “pong.” They were told that pong would be used to assess cardiovascular responses during an eye-hand coordination task, and that two subjects could be tested simultaneously if they competed.

The experimenter demonstrated how to control the game paddles and explained how points were scored. He told the subjects to try to win as many games as possible during an 8-min competition, and stated that the player who won the most games each week would win a $10.00 gift certificate to the campus book store, while the player who won the most games all semester would receive a $50.00 bonus. Subjects were told that game scores would be used if needed as a tie breaker, and the confederate was asked to call out scores at the conclusion of each game.

The confederate had been instructed to lose the first game in a close contest (to keep subject motivation and effort high), but to win two-thirds of all subsequent games by increasingly greater margins. In the non-harassment condition, the confederate did not speak except to report scores, whereas in the harassment condition, the confederate made a series of negative comments about the subject’s playing ability after the second game was played.

After completion of pong competition, subjects completed two scales that assessed feelings experienced during the competition and perceptions of treatment by the confederate. This required 3 min. Next, subjects were asked to relax for 5 min. They were instructed to close their eyes and imagine themselves on a beautiful, white sand beach on a warm, sunny day. They were provided with a personal tape player and a tape of ocean sounds to facilitate relaxation. At the conclusion
of this period, the subjects were told that the experiment was completed, and asked to read and sign a short debriefing statement.

Harassment

Harassment was used to provoke anger and feelings of mistreatment in approximately half of the subjects in each hostility group. In the harassment condition, after the confederate reported the score of the second game, he added comments such as, “You’re not very good at this,” “You’re not very coordinated,” or “Can’t you keep your eye on the ball?” If the confederate were easily beating a subject, he might count off the score, “6 nothing, 7 nothing, 8 nothing . . .,” state that he was trying for a shutout, or take his hand off the game paddle to “give” the subject a few points before resuming the rout. Comments were made at about one minute intervals during the competition.

Affect and perceived treatment ratings

Subjects indicated affects they experienced during the competition and perceptions of treatment by the confederate using two, 7-point, Likert-type scales designed by the author. The first measured the degree to which subjects experienced anxiety, sadness, frustration, embarrassment, annoyance, anger, and abuse. The second assessed perceived mistreatment using 10 pairs of items, such as “fair-unfair,” “inoffensive-offensive,” “considerate-inconsiderate,” and “friendly-unfriendly.” This scale was similar to one used earlier to evaluate a competitor (Pope et al., 1990). The individual affects were scored separately; mistreatment was scored as the sum of the ratings for the 10 items.

Physiological measures

Systolic blood pressure (SBP), diastolic blood pressure (DBP), and heart rate (HR) were measured with a Critikon 1846SX Vital Signs Monitor. This automated system uses the oscillometric method to estimate blood pressure and heart rate. It was programmed to record cardiovascular measures at 1 minute intervals during all task periods, but not while instructions were presented between periods.

Data reduction and analysis

Hostility scores were compared between groups using an analysis of variance (ANOVA) with harassment condition and hostility group as the between subjects factors. Effects of hostility and harassment on affect ratings were tested with multivariate analysis of variance (MANOVA) using all seven affects as the dependent variables. Effects of the same factors on perceptions of mistreatment by the confederate were tested using ANOVA on total scores from the 10 item scale.

The dependent cardiovascular variables were systolic blood pressure, diastolic blood pressure, and heart rate. Baseline SBP, DBP, and HR were taken as the average of the final two readings for each variable during the baseline period. Mean scores during the competition, rating period, and recovery period were computed for each cardiovascular variable, and change scores were calculated by subtracting baseline values from period means.

Differences in baseline SBP, DBP, and HR were assessed with MANOVA. Hostility (low, high) and condition (non-harassment, harassment) were the between subjects factors. The effects of hostility and harassment condition on cardiovascular change scores were tested with repeated measures, multivariate analysis of covariance (MANCOVA), using the same between subjects factors, and period as the repeated measures factor. Baseline values were used as covariates to adjust for possible effects of baseline differences. When multivariate effects were significant, a separate repeated measures analysis of covariance (ANCOVA) was performed for SBP, DBP, and HR, and p-values reflect Greenhouse-Geisser corrections for violations of sphericity. Tests of simple effects were used to evaluate significant interactions.

3. Results

Hostility scores ranged from 6 to 37; the median score was 22. Mean scores of subjects scoring below the median (15.2 ± 0.7) differed from those of subjects scoring above the median (28.7
Table 1
Self-reported affect during pong competition

<table>
<thead>
<tr>
<th></th>
<th>Low hostility</th>
<th>High hostility</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Non-harassed</td>
<td>Harassed</td>
</tr>
<tr>
<td></td>
<td>(n = 19)</td>
<td>(n = 16)</td>
</tr>
<tr>
<td>Anger</td>
<td>3.2 (0.3)</td>
<td>3.3 (0.2)</td>
</tr>
<tr>
<td>Frustration</td>
<td>4.0 (0.3)</td>
<td>3.6 (0.4)</td>
</tr>
<tr>
<td>Annoyance</td>
<td>4.1 (0.3)</td>
<td>3.4 (0.4)</td>
</tr>
<tr>
<td>Embarrassment</td>
<td>3.4 (0.3)</td>
<td>4.0 (0.4)</td>
</tr>
<tr>
<td>Anxiety</td>
<td>3.9 (0.3)</td>
<td>3.9 (0.3)</td>
</tr>
<tr>
<td>Sadness</td>
<td>3.2 (0.3)</td>
<td>3.8 (0.3)</td>
</tr>
<tr>
<td>Abuse</td>
<td>2.4 (0.4)</td>
<td>3.2 (0.4)</td>
</tr>
</tbody>
</table>

* Data from one subject were incomplete.

± 0.8), $F(1,64) = 181.8$, $p < 0.001$. Scores were similar to those reported for low (14.4) and high (31.3) hostile subjects by Christensen and Smith (1993). There was also a hostility group by harassment condition interaction, $F(1,64) = 6.4$, $p < 0.05$. In the low hostility group, harassed subjects had near-significantly lower hostility (13.9 ± 1.0) than non-harassed subjects (16.3 ± 0.9), $F(1,64) = 2.9$, $p < 0.1$. However, in the high hostility group, harassed subjects had marginally higher hostility (29.9 ± 1.0) than non-harassed (27.3 ± 1.0) subjects, $F(1,64) = 3.5$, $p < 0.07$. These slight effects were in the appropriate direction for maximizing hostility differences between harassed high and low hostile subjects.

MANOVA showed a marginally significant effect of hostility on overall affect during the pong competition, $F(7,57) = 2.07$, $p < 0.07$. Univariate tests revealed that high hostile subjects reported greater anger (4.0 ± 0.2 vs. 3.2 ± 0.2), $F(1,63) = 5.5$, $p < 0.05$, annoyance (4.5 ± 0.2 vs. 3.8 ± 0.2), $F(1,63) = 5.4$, $p < 0.05$, and frustration (4.7 ± 0.2 vs. 3.8 ± 0.2), $F(1,63) = 7.6$, $p < 0.01$, than low hostile subjects. Harassed subjects reported

Table 2
Baseline cardiovascular means and change scores

<table>
<thead>
<tr>
<th></th>
<th>Low hostility</th>
<th>High hostility</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Non-harassed</td>
<td>Harassed</td>
</tr>
<tr>
<td></td>
<td>(n = 19)</td>
<td>(n = 16)</td>
</tr>
<tr>
<td>Baseline cardiovascular values</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SBP (mm Hg)</td>
<td>122.2 (3.0)</td>
<td>121.3 (3.4)</td>
</tr>
<tr>
<td>DBP (mm Hg)</td>
<td>63.8 (1.4)</td>
<td>59.7 (2.5)</td>
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<tr>
<td>HR (bpm)</td>
<td>72.3 (2.8)</td>
<td>70.3 (2.7)</td>
</tr>
<tr>
<td>Cardiovascular change scores</td>
<td></td>
<td></td>
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<tr>
<td>Competition</td>
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</tr>
<tr>
<td>SBP (mm Hg)</td>
<td>23.2 (2.4)</td>
<td>27.5 (2.8)</td>
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<tr>
<td>DBP (mm Hg)</td>
<td>12.3 (1.8)</td>
<td>15.8 (2.4)</td>
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<tr>
<td>HR (bpm)</td>
<td>15.4 (2.4)</td>
<td>20.8 (4.3)</td>
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<tr>
<td>Checklist completion</td>
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<td></td>
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<tr>
<td>SBP (mm Hg)</td>
<td>2.1 (2.2)</td>
<td>11.1 (2.6)</td>
</tr>
<tr>
<td>DBP (mm Hg)</td>
<td>0.6 (1.6)</td>
<td>6.4 (2.4)</td>
</tr>
<tr>
<td>HR (bpm)</td>
<td>2.7 (1.5)</td>
<td>5.8 (1.9)</td>
</tr>
<tr>
<td>Recovery</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SBP (mm Hg)</td>
<td>3.3 (1.5)</td>
<td>5.0 (1.7)</td>
</tr>
<tr>
<td>DBP (mm Hg)</td>
<td>0.6 (1.5)</td>
<td>1.2 (1.9)</td>
</tr>
<tr>
<td>HR (bpm)</td>
<td>-0.6 (1.3)</td>
<td>0.6 (1.2)</td>
</tr>
</tbody>
</table>
greater overall negative affect than non-harassed subjects, $F(7,57) = 3.6, p < 0.01$, and univariate tests showed these effects to be significant for sadness $(3.9 \pm 0.2$ vs. $3.3 \pm 0.2), F(1,63) = 5.4, p < 0.05$, and feelings of abuse $(3.3 \pm 0.3$ vs. $2.5 \pm 0.3), F(1,63) = 4.3, p < 0.05$. We did not find the predicted hostility $\times$ harassment condition interaction; high hostile subjects did not show greater anger or other negative affects when harassed than low hostile subjects. Effects of hostility and harassment condition on affect ratings are shown in Table 1.

Hostility did not affect perceptions of mistreatment by the confederate, but harassed subjects reported greater mistreatment $(41.2 \pm 2.1)$ than non-harassed subjects $(25.4 \pm 2.1), F(1,63) = 29.2, p < 0.001$. Perceptions of mistreatment were not influenced by a hostility $\times$ harassment interaction.

There were no differences in baseline cardiovascular measures between groups; MANOVA revealed no effects of hostility, harassment condition, or their interaction. Baseline cardiovascular measures are shown in Table 2.

Neither hostility nor harassment condition influenced overall cardiovascular change scores directly; repeated measures MANCOVA revealed no significant main effects. Nor did these factors interact with each other to influence cardiovascular reactivity. However, there was a significant multivariate effect of period, $F(6,252) = 60.9, p < 0.001$, and a significant period $\times$ harassment interaction, $F(6,252) = 2.3, p < 0.05$. Univariate analyses of covariance showed the interaction to be significant only for SBP change scores, $F(2,128) = 6.5, p < 0.01$. Tests of simple effects showed that harassed subjects had greater SBP reactivity $(10.9 \pm 1.6)$ than non-harassed subjects $(2.7 \pm 1.6)$ during only the post-task rating period, $F(1,65) = 4.5, p < 0.05$. Cardiovascular change scores are presented in Table 2.

To evaluate possible effects of perceived mistreatment on cardiovascular responses, a repeated measures MANCOVA was performed using hostility and mistreatment (dichotomized by median splits) as between subjects factors, period as the within subjects factor, and baseline cardiovascular measures as covariates. There were no significant main effects of hostility or mistreatment, nor a significant interaction of the two factors. There was a near significant mistreatment $\times$ period interaction overall, $F(6,252) = 1.9, p < 0.09$, with a significant univariate effect for SBP reactivity, $F(2,128) = 5.0, p < 0.01$. Tests of simple main effects showed that SBP reactivity did not differ between subjects who reported more mistreatment versus less mistreatment during the competition $(25.4 \pm 2.1$ vs. $25.9 \pm 1.4)$ or recovery periods $(5.5 \pm 1.2$ vs. $3.9 \pm 1.2)$, respectively. However, subjects who reported more mistreatment had higher SBP change scores during the affect and treatment rating period than subjects who reported less mistreatment $(10.3 \pm 1.9$ vs. $3.8 \pm 1.5), F(1,65) = 7.3, p < 0.01$.

4. Discussion

The main finding of this investigation was that cynical hostility did not influence cardiovascular reactivity during a competitive interpersonal task, in which harassment was used as an anger provocation. Contrary to our predictions, hostility did not interact with harassment to cause greater anger and greater cardiovascular reactivity in harassed high hostile subjects than in harassed low hostile subjects. There was also no main effect of hostility on cardiovascular reactivity, even though high hostile subjects reported more anger than low hostile subjects regardless of harassment. We found that harassment influenced perceived mistreatment by the confederate, and cardiovascular reactivity, but the cardiovascular effects were limited. SBP reactivity was greater in harassed than in non-harassed subjects during only the post-task affect rating period. Assessment of possible interactive effects of hostility and perceived mistreatment revealed that subjects who reported greater mistreatment had larger SBP responses during the rating period than subjects who reported less mistreatment, but no main or interactive effects of hostility on cardiovascular reactivity were found.

Because harassment did not lead to greater perceived anger regardless of hostility, one may question whether effective provocation was used
and whether the hypothesis was adequately tested. Based on affect and perceived treatment ratings, we suggest that provocation was effective and that the hypothesis was tested. Harassed subjects reported greater perceived mistreatment and greater overall negative affect during the competition than non-harassed subjects; however the latter consisted primarily of stronger feelings of sadness and abuse, which may also reflect mistreatment, but not necessarily anger. Hostility influenced overall affect scores, primarily through effects on frustration, annoyance, and anger, which are constructs consistent with anger arousal.

Since high hostile subjects reported experiencing greater anger, frustration, and annoyance during the competition than low hostile subjects, the hypothesis that high hostile subjects would experience greater anger and greater cardiovascular reactivity than low hostile subjects during an aversive interpersonal interaction was, in fact tested. But, if harassment did not provoke anger, what did? Perhaps, the competition itself was sufficiently provocative without harassment to provoke anger, as most subjects were soundly defeated by the confederate in a series of contests. In order to explain the failure of hostility to influence cardiovascular reactivity, we reject the suggestion that provocation was ineffective, and suggest that it may have been too potent, leading to comparably high task engagement and physiological arousal in non-harassed and harassed subjects. Although anger-related ratings were greater in high than in low hostile subjects, the differences were small, amounting to less than 1 point on each 7 point scale. It is possible that these ratings may not have been accurate indices of arousal.

The magnitudes of cardiovascular responses suggest that arousal was probably high in all subjects during the pong competition. SBP change scores during competition ranged from 23.2 ± 2.4 to 27.0 ± 2.6 mm Hg across all groups. This compares to maximum SBP change scores of 13.2–17.2 mm Hg in studies in which reactivity was greater in high than in low hostile subjects (Christensen and Smith, 1993; Smith and Allred, 1989; Suarez and Williams, 1989). Allred and Smith (1991) also suggested that comparable physiological arousal may have eliminated expected reactivity differences between high and low hostile subjects during a discussion task with harassment. In that study as in the present one, high hostile subjects reported greater anger than low hostile subjects. We are left to question whether self-report anger ratings are valid measures of anger arousal.

Although unrelated to cynical hostility, cardiovascular reactivity differences were found; harassed subjects had greater SBP responses than non-harassed subjects during the affect and perceived treatment rating period. This may have been due to arousal resulting from perceived mistreatment. In fact, substituting mistreatment for harassment in the analysis revealed that subjects who reported greater mistreatment had greater SBP responses during the post-task rating period than subjects who reported less mistreatment. This finding is intriguing, but because mistreatment was measured with an unvalidated scale, we must be cautious in its interpretation. Although we can accept that harassed subjects had more negative evaluations of their interaction with the confederate than non-harassed subjects, we can not be certain exactly what construct our mistreatment scale measured.

SBP reactivity differences resulting from harassment (or perceptions of mistreatment) may not have appeared during the pong competition because the SBP responses were already very large, probably due to arousal from the competition. The differences may have appeared during the rating period because reactivity had decreased enough for the effects of harassment to influence reactivity. It is also possible that appraisal of affect and treatment by the confederate contributed to greater arousal and SBP responses in harassed than in non-harassed subjects during the rating period.

Failure to find cardiovascular reactivity differences between high and low cynically hostile persons exposed to an aversive interpersonal interaction leads us to question the validity of the hyper-reactivity hypothesis linking hostility to cardiovascular disease. Cynical hostility does not consistently influence anger and cardiovascular reactivity, even when provocation is present. Whether
we accept the explanations that reactivity differences may be absent because anger provocation is sometimes too weak or sometimes too strong, we find ourselves searching for situations that are provocative enough to cause elevated anger in hostile individuals, but not so provocative as to cause comparable anger arousal in less hostile individuals. The literature fails to provide a description of situational factors that consistently produce affective and cardiovascular reactivity differences that depend on cynical hostility, and Suls and Wan (1993) caution us to consider the ecological validity of factors that are shown to produce enhanced reactivity in hostile subjects.

The results of the present study do not invalidate the cardiovascular hyperreactivity hypothesis relating hostility to coronary heart disease, but they do provide additional reason to question it. We should keep in mind that support for the hypothesis comes from a small number of studies, and several studies have failed to confirm the hypothesis. Suls and Wan (1993) reported that various measures of hostility produce small or inconsistent effects on blood pressure and heart rate reactivity, and that other forms of physiological hyperreactivity may contribute to coronary heart disease.

Further research might directly test explanations for inconsistent influences of cynical hostility on affective and cardiovascular responses. For example, subjects might be exposed to several levels of provocation in order to test whether differential anger arousal in high and low hostile subjects can explain reactivity differences.

References


