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Stress and personality as factors in women's cardiovascular reactivity

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Abstract

An experiment was conducted to investigate the relationships among Type A behavior, hostility and cardiovascular reactivity (CVR) in women. Changes in heart rate, blood pressure and skin conductance from baseline to task levels were used to assess reactivity. These measures were obtained from 96 women during a seated baseline period, a reaction time task and during an oral IQ quiz. Analyses indicated that Type A and high hostile women were more reactive to an oral IQ quiz and reaction time stressors than Type B and low hostile women. Specifically, Type As showed significantly greater increases in systolic blood pressure in the reaction time task and greater mean arterial pressure and systolic blood pressure increases in the IQ quiz. High hostiles evidenced significantly higher systolic blood pressure and diastolic blood pressure in the RT task and higher mean arterial pressure and diastolic blood pressure in the IQ quiz. It was concluded that Type A personality and hostility can predict greater reactivity in women to two different stressors. The oral quiz generated greater reactivity than the RT task and thus may be a more stressful task. © 1998 Elsevier Science B.V.

Keywords: Cardiovascular reactivity (CVR); Reaction time (RT); Type A; Type B

1. Cardiovascular reactivity

Cardiovascular reactivity (CVR) can be defined as a change in cardiovascular activity between a resting baseline and an active condition. The active condition typically involves some task requiring mental manipulation and/or physical exertion. It is generally accepted that the activation of the cardiovascular system in times of stress has evolved as a psychophysiological reflex to danger (Sherwood and Turner, 1992). The vast majority

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of studies of CVR have measured systolic blood pressure (SBP), heart rate (HR) and diastolic blood pressure (DBP). A less frequently used measure is mean arterial pressure (MAP), a weighted composite of SBP and DBP. The importance of CVR is that individuals who demonstrate particularly high CVR to some stressor, are more likely to develop coronary heart disease (Sherwood and Turner, 1992).

If individuals truly differ in CVR, there should be some stability of reactivity over different situations. Various tasks have been used to assess CVR. Houston et al. (1989) successfully predicted that individuals characterized as highly hostile would be more reactive to a mental arithmetic (MA) task than those who are less hostile. Others have found the MA task to generate an increased cardiovascular response in other types of hypothetically hyperreactive individuals such as those with a parental history of cardiovascular disease (Fredrikson et al., 1991) and men with Type A personality (Sundin et al., 1995). CVR studies have incorporated other tasks designed to provoke the classical defense response including video games that pose psychomotor challenges, anagram tasks, stressful interviews and public speaking.

1.1. Type A personality and hostility

The Type A behavior pattern (TABP), a concept developed by Friedman and Rosenman (1959), is a primary coronary heart disease (CHD) risk factor based upon a set of personal characteristics. These characteristics include impatience, hostility, job involvement and competitiveness. The hostility component shows promise as a predictor of CHD per se. Many studies have found it to be a strong predictor of CVR (Dembroski and Costa, 1987; Houston et al., 1989; Rosenman, 1990; Contrada et al., 1990) and several reviews indicate that it is the best predictor of the various TABP components (Ganster et al., 1991). One of the first studies involved a sample of 424 patients about to undergo angiography (Williams et al., 1980). Hostility and Type A scores were strongly correlated with CHD, with hostility being more predictive of CHD than Type A.

Currently, the exact definition of hostility is not generally agreed upon. Hostility is more cognitive than emotional or behavioral. It has been defined as 'having a set of negative attitudes, beliefs and appraisals concerning others' (Smith, 1992, p. 139) leading one to think of others as sources of mistreatment and frustration. A main point regarding its definition focuses upon distinguishing hostility from anger and aggression. The concept of hostility can be more clearly understood in light of the distinction between cognition, affect/emotion and behavior (Smith, 1992). Aggressiveness describes a behavior more than a cognition or emotion. It can be defined as behaviors which involve physical and non-physical actions taken with a goal towards hurting someone. Anger refers to an emotion or emotional state rather than a set of thoughts or actions and is considered to be a negative emotional response to feelings of mistreatment or provocation (Smith, 1992). It does not have to be carried out by an action, although it does contain some cognitive content.

In order to clarify the relationship among hostility, CVR and coronary heart disease, many investigations were undertaken, in the 1980s and into the 1990s. Overall, there were six major prospective studies involving hostility and CHD or reactivity. In general, the six prospective studies of CHD and hostility taken together led to mixed results. Three showed no relationship between CHD and hostility and three resulted in positive associations between hostility and disease. One of the studies reporting negative results has been criticized on methodological grounds (Williams, 1987; Smith, 1992). The criticism is based upon the finding that the research participants, who produced very low hostility scores, scored high on a social desirability scale, thus implying that their reports on the hostility scale were inaccurate (Smith and Pope, 1990). The other two prospective studies reporting no association between health and hostility (Leon et al., 1988; Hearn et al., 1989) have not been dismissed. On the positive side, three prospective studies with results supporting a connection between CHD and hostility have encouraged investigators to continue working with hostility.

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