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SELF-EFFICACY AS A COMPONENT OF ACTIVE COPING: EFFECTS ON CARDIOVASCULAR REACTIVITY

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Abstract—Active coping remains a poorly understood construct in cardiovascular reactivity testing. We have shown that active coping comprises two independent effects: the enhanced control and the effort of exercising control. The present study tested the proposition that, with effort left unconstrained, increased self-efficacy will increase cardiovascular response. Forty women were assigned to low or high self-efficacy conditions; self-efficacy was manipulated using false feedback. Subjects then engaged in a video game shape-matching task, while blood pressure and heart rate were monitored. SBP and DBP changes were smaller in the low self-efficacy group, as predicted: 17.9 versus 25.2 mmHG for SBP ($p<0.05$); and 8.7 versus 13.0 mmHG for DBP ($p=0.07$). Heart rate was similar for the two conditions. We conclude that self-efficacy for a task may be an integral part of the active coping process, indirectly affecting the blood pressure response by acting on the effort involved in the coping response.

Keywords: Cardiovascular reactivity; Perceived control; Self-efficacy.

The concept of active coping, as employed in the psychophysiological laboratory, has been a productive source of research as well as an enigma [1-3]. First described by Obrist [4], it represents an important advance in the way we think about the stress-illness relationship, in that it casts the person as an integral part of the process, working to overcome a stressful challenge, as opposed to being a passive recipient.

The active coping construct suffers, however, from a lack of specificity. Active coping elevates blood pressure and heart rate; however, it is unclear which aspect of the process actually produces the elevations. It has been suggested that active coping comprises both the perceived control due to the *availability* of a coping response [1, 3, 5] and the effort involved in the *execution* of the response; and these typically co-vary in active coping studies [3, 6, 7], as they probably do in real life.

The results of two studies we had conducted previously led to the present study.

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Study 1: In an examination of the multidimensionality of the active coping construct, we found that, with effort maintained constant, subjects in an active coping condition evidenced blood pressure *decreases*, rather than increases, in contrast to subjects for whom no coping response was available [3]. In this study, effort was controlled by having all subjects work to their individual capacities throughout the task period. Thus, only the *availability* of the coping response, that is, the perceived control over outcomes, was manipulated. We concluded that the cardiovascular response observed during active coping comprises at least 2 independent, additive, components: the (greater) increase due to the effort involved in executing the response and the (smaller) decrease due to the increased control when active coping is possible. Thus, when effort and control co-vary, blood pressure and heart rate increases will usually be observed, with the smaller, negative effects of enhanced control obscured by the greater positive effects of effort.

Study 2: We next examined the effects of *self-efficacy* on cardiovascular responses [8]. Self-efficacy refers to confidence in one's ability to behave in such a way as to produce a desirable outcome for a given task [9]. Percepts of self-efficacy have been shown in themselves to affect heart rate, blood pressure, and serum catecholamine levels in threatening situations [10, 11]. It is important to note that self-efficacy does not refer to a "trait," in the sense that a given individual can be ranked on this dimension across situations. Instead, self-efficacy must be assessed for an individual as a function of a specific situation. For example, a person might have high self-efficacy for playing tennis, but low self-efficacy for public speaking. We found that, like the low control subjects in Study 1, low self-efficacy subjects had significantly greater blood pressure elevations in response to the stressor than did high self-efficacy subjects. In Study 1, effort was maintained constant across control conditions, allowing the effect of differential levels of control to emerge. In Study 2, effort was constrained in much the same manner, that is, was maximized for all subjects, since the math task was probably viewed by the subject—attendees at a competitively academic precollege program—as a meaningful challenge and indicator of intelligence. Interestingly, high self-efficacy subjects reported having significantly higher levels of perceived control over outcomes than the low self-efficacy subjects.

Taken together, the results of Studies 1 and 2 suggest that perceived control and self-efficacy may be related and may have similar effects on cardiovascular response. Yet, the two constructs are intended to reflect subtly different processes. Control in these studies refers to the perception of the way in which the *environment* is arranged; one's skills and abilities may or may not be related to the outcome. Self-efficacy, however, refers to a perception about *oneself*; the confidence in one's ability to produce a particular, that is, desirable, outcome. It seems likely that both are involved in the active coping process.

As discussed above, with effort left unconstrained, higher levels of control (i.e., an active coping situation) usually produce *larger* blood pressure increases than low control. In parallel to this, we hypothesize that, with effort left unconstrained, subjects with higher self-efficacy for a particular task will exhibit greater effort in the course of the task, and will therefore show greater cardiovascular increases, compared to low self-efficacy subjects.

In order to test this, self-efficacy in the present study was directly manipulated (rather than measured, as in Study 2). The task used in the present study had one