

GENDER DIFFERENCES IN CARDIOVASCULAR REACTIVITY:
EFFECTS OF THE GENDER RELEVANCE OF THE STRESSOR

by

Steven Joseph Patrick Lash

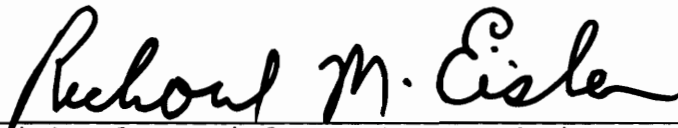
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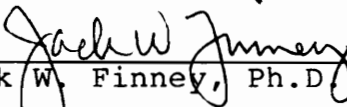
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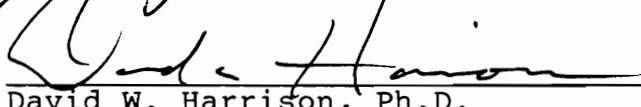
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(ABSTRACT)

Previous research suggests that sex differences in cardiovascular reactivity (CVR) are a function of differences in cognitive appraisal of stressors as masculine-relevant or feminine-relevant tasks. Two studies were conducted to examine the role of the appraised gender relevance of stressors as a mediator of sex differences in CVR. In the first study the CVR of male and female college students ($N = 95$) to the cold-pressor test (CPT) was compared under masculine-relevant and gender-neutral stressor instructions during an anticipation phase, a stressor phase, and a recovery phase. Men were expected to show greater CVR than women to the masculine-relevant CPT, but not to the gender-neutral CPT. Results supported this prediction for systolic blood pressure (SBP) and heart rate (HR) reactivity, but not diastolic blood pressure (DBP) reactivity. In the second study the CVR of male and female college students ($N = 121$) to the CPT was compared under masculine-relevant and female-relevant stressor instructions

during an anticipation phase, a stressor phase, and a recovery phase. Men were predicted to show greater CVR than women to the masculine-relevant CPT while women were expected to show greater CVR to the feminine-relevant CPT. Results supported these predictions for SBP, but not HR reactivity. The results for DBP were mixed. Men did not show greater DBP reactivity than women to the masculine-relevant CPT, but women showed greater DBP reactivity than men to the feminine-relevant CPT. The potential influence of sex differences in cognitive appraisal of situations on CVR and coronary heart disease is discussed.

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According to Matthews (1986) reactivity is "the deviation of a physiological response parameter(s) from a comparison or control value that results from an individual's response to a discrete, environmental stimulus" (pp. 461-462). Cardiovascular reactivity (CVR) has received much attention as a potential mechanism in the development of coronary heart disease (CHD; e.g., Krantz & Manuck, 1984; Matthews et al., 1986). The disease process is believed to involve injury to the arterial wall which is exacerbated by hemodynamic and endocrine correlates of sympathetic nervous system activity. According to this hypothesis, systolic blood pressure (SBP), diastolic blood pressure (DBP), and heart rate (HR) reactivity to stressors play an important role in the development of atherosclerosis (for a review see Clarkson, Manuck, & Kaplan, 1986). Additionally, sympathetic nervous system activation and corresponding CVR are believed to contribute to essential hypertension, dysrhythmias, angina pectoris, myocardial infarction, and sudden cardiac death (for reviews see Manuck & Krantz, 1986; Schneiderman, 1983).

Manuck, Kaplan, and Clarkson (1983; 1985) found that male and female cynomolgus monkeys who showed high levels of HR reactivity to the presence of an experimenter wearing a glove used to capture the monkeys showed approximately twice the coronary artery atherosclerosis as less reactive monkeys. In a prospective study with humans, Keys et al.

(1971) found that subjects who were hyperreactive to the cold-pressor test (CPT) in terms of SBP or DBP were two to three times more likely to have developed CHD 23-years later than were less reactive subjects. Similarly, exaggerated SBP reactivity to the CPT has been shown to predict future hypertension (Menkes et al., 1989). In addition, retrospective studies comparing individuals with and without CHD on reactivity to laboratory stressors such as painful stimuli, computational tasks, or threatening interviews have generally found greater SBP reactivity among individuals with CHD (for a review see Krantz, Glass, Schaeffer, & Davia, 1982).

Many authors have proposed that exaggerated CVR to stressors among men relative to women may explain the increased incidence of cardiovascular related morbidity and mortality among men (e.g., Polefrone & Manuck, 1987; Saab, 1989; Stoney, Davis, & Matthews, 1987). Men are two to three times more likely to develop CHD than women even when risk factors such as resting blood pressure, cigarette smoking, serum cholesterol level, relative weight, and glucose intolerance are taken into account (Truett, Cornfield, & Kannel, 1967; Wingard, Suarez, & Barret-Connor, 1983). Recent reviews (Polefrone & Manuck, 1987; Saab, 1989) and a meta-analysis (Stoney et al., 1987) of the literature on sex differences in CVR suggest that men show

greater SBP reactivity than women while they do not consistently differ on DBP or HR reactivity. Thus, to the extent that CVR is related to CHD, greater SBP reactivity among men may contribute to the large unexplained sex differential in CHD.

One possible explanation of sex differences in CVR is that men are hyperreactive to stressors relative to women due to constitutional differences. Some evidence supports this proposal. For instance, several reviewers suggest that female sex hormones may attenuate CVR to stressors (Polefrone & Manuck, 1987; Saab, 1989). However, other findings are inconsistent with this explanation. In some studies no sex differences in CVR are found while in others women have been found to show greater DBP reactivity (e.g., Lawler, Allen, Critcher, & Standard, 1981), HR reactivity (e.g., Holmes, Solomon, & Rump, 1982) and norepinephrine reactivity (e.g., Lundberg, de Chateau, Winberg, & Frankenhaeuser, 1981) than men. Additionally, Van Egeren (1979) found that women exhibited greater HR reactivity while playing a game against a competitive than a cooperative person. In contrast, men showed greater HR reactivity against a cooperative than a competitive person. Rather than supporting a constitutional hypothesis, this study and the inconsistent pattern of sex differences in CVR across studies suggest that these differences may depend on

the type of stressor employed.

Some authors have speculated that this Sex X Situation interaction in CVR may depend on sex differences in cognitive appraisal of situations (Frankenhaeuser, 1983; Jorgensen & Houston, 1981; Polefrone & Manuck, 1987). According to Lazarus and Folkman's (1984) cognitive theory of stress, an individual appraises the degree to which a situation is relevant to himself or herself and this appraisal plays a large part in determining how stressful the situation will be for him or her. The more challenging and/or threatening a situation is appraised to be by an individual, the more stressful it will be for him or her, and the larger will be his or her reactivity to it. Thus, the same situation can be differentially stressful and produce different amounts of CVR for two individuals who appraise it differently. If sex differences in CVR are a function of sex differences in the appraisal of stressors, men and women should differ on CVR to stressors appraised as differentially relevant by them, but not on those appraised as equally relevant.

Existing literature provides some support for the idea that sex differences in appraisal of the stressfulness of situations exist and that these are related to CVR. Men appraise challenges to intellectual, physical, occupational or sexual abilities, and situations requiring emotional

expressiveness, or subordination to women as more stressful than do women (Eisler & Skidmore, 1987). Conversely, women appraise challenges to nurturing ability, evaluations of physical appearance, situations calling for detachment in intimate relationships, situations calling for assertiveness, and situations involving possible victimization as more stressful than do men (Gillespie & Eisler, in press). Although men more frequently show greater CVR than women, the majority of stressors employed in the CVR literature appear to be masculine-relevant stressors (e.g., cognitive achievement, psychomotor skill, and physical performance/endurance tests). Only rarely have feminine-relevant stressors been examined. In one study that appears to have employed a feminine-relevant stressor, evaluation of nurturance ability, women were found to show greater CVR. Lundberg and colleagues (1981) found women showed greater neuroendocrine reactivity than men when their child's developmental progress was being evaluated. However, in two other studies women were not found to show greater CVR than men to feminine-relevant speech tasks (Girdler, Turner, Sherwood, & Light, 1990; Stoney, Matthews, McDonald, & Johnson, 1988).

These studies provide some support for the hypothesis that cognitive appraisal of the gender relevance of a stressor is related to sex differences in CVR. However, to

test whether it is the gender relevance of stressors that produces CVR sex differences, the gender relevance of a single stressor must be directly manipulated. Lash, Eisler, and Schulman (1990) compared men who differed on a measure of appraisal of masculine-relevant stressors on CVR to a masculine-relevant and a gender-neutral stressor. Specifically, they compared men who tend to appraise masculine-relevant stressors as highly stressful with those who do not on CVR to the CPT. When the CPT was presented as a masculine-relevant stressor, those men who tend to appraise masculine-relevant stressors as highly stressful showed greater CVR than those who do not. In contrast, when these groups were compared on a gender-neutral CPT, no CVR differences were found. By directly manipulating the gender relevance of the CPT, this study demonstrated that differences in cognitive appraisal of masculine-relevant stressors among men produces differences in CVR.

If cognitive appraisal of the gender relevance of a stressor plays a role in mediating sex differences in CVR as the above review suggests, these differences should occur as a function of appraisal. Specifically, men should show greater CVR than women to masculine-relevant stressors, women should react more strongly than men to feminine-relevant stressors, and no gender differences should be found on gender-neutral stressors. This hypothesis was

tested in a series of two studies in which men and women were compared on CVR to the CPT with instructions varied to render it a masculine-relevant, a feminine-relevant, or a gender-neutral stressor. In Study 1 men and women's SBP, DBP, and HR reactivity were compared on a masculine-relevant and a gender-neutral CPT. In Study 2, men and women's SBP, DBP, and HR reactivity were compared on a masculine-relevant and a feminine-relevant CPT. The gender relevance of the CPT was manipulated by presenting instructions for the task which emphasized different characteristics supposedly associated with good performance. In the masculine-relevant condition, the CPT instructions emphasized characteristics associated with good performance which men, but not women, tend to find highly stressful. In the feminine-relevant condition those characteristics which women, but not men, tend to find highly stressful were emphasized. In the gender-neutral challenge condition characteristics that are particularly relevant to men or women were deemphasized.

Method - Study 1

Subjects

One hundred twenty-nine introductory psychology students at Virginia Tech were screened for participation. Thirty-four were eliminated from the final sample due to medical problems ($N = 15$), failure to return for baseline measurement ($N = 5$), lost data resulting from equipment related problems ($N = 3$), or failure to keep their hands in the ice water for 75 seconds ($N = 11$).

The final sample consisted of 95 medication-free, normotensive subjects who ranged in age from 18 to 26 years ($M = 19.9$ years). Mean values for height and weight for men (157.9 pounds and 70.6 inches, respectively) were significantly greater than those for women (128.6 pounds and 65.1 inches, respectively). Subjects were randomly assigned to the masculine-relevant or the gender-neutral CPT condition using a random number table. Twenty-two men and 25 women participated in the masculine-relevant CPT condition while 23 men and 25 women participated in the neutral CPT condition.

Apparatus and Measures

SBP, DBP, and HR were measured with the Industrial and Biomedical Sensors Corporation's Automatic Blood Pressure Monitor (1987; model SD-700A). This device detects Korotkov sounds to indirectly measure BP and oscillations within the cuff bladder to assess HR. Phase V is used in the

assessment of DBP. BP accuracy for this instrument has been reported to be within 3 mm Hg of those auscultated and heart rate accuracy to be 2%, or 1 beat per minute (IBS, 1987). Correlations of SBP and DBP measures derived with this instrument and those concurrently taken with a standard Baum mercury sphygmomanometer on college students in our laboratory were consistently high ($\underline{r} = .99$, $\underline{p} < .05$ for SBP; $\underline{r} = .92$, $\underline{p} < .05$ for DBP). The ice water for the CPT was maintained in a small ice cooler (Gott Corporation, model 1916/2) at 4 °C. Water temperature was measured using a standard mercury thermometer (Fisher Scientific, model 14-985E) and subjects were weighed using a standard scale (Counselor).

Self-Reported Appraisal. The Experimental Experiences Questionnaire (see Appendix D) was designed to determine subjects' appraisal of the CPT. Subjects indicated on 7-point scales (0 to 6) how well they thought men would perform on the CPT, how well they thought women would perform on it, and how well they coped with it. Additionally, subjects indicated on 7-point scales how challenged, threatened, and stressed they were by the CPT.

Experimental Design

BP and HR were assessed during baseline, anticipation, CPT, and recovery phases of the experiment. Mean responses during these phases were compared in a series of 2 (Sex) X 2

(CPT Condition: Masculine-relevant vs. Gender-neutral) factorial designs. Because CVR was assessed across several phases, a repeated measures factor was also included.

Procedure

One-half the Subjects in each CPT condition were randomly assigned to a male and one-half to a female experimenter. The experimenters recorded all data on a data sheet (see Appendixes E and H). Subjects who failed to abstain from caffeine and alcohol for eight hours, or from tobacco for one hour prior to the CPT session were rescheduled. Upon entering the laboratory the subject's weight and height were measured prior to being seated in a cushioned chair by the experimenter. The circumference of the subject's right arm two inches above the antecubital fossa was measured. An appropriate-size BP cuff was placed on this arm with the bottom edge of the cuff one inch above the antecubital fossa and the microphone positioned over the brachial artery. Then the subject was told to minimize all movement while seated. Also, she or he was informed that her or his BP would be measured periodically, that audiotaped instructions would be played from behind a partition, and that the experimenter would monitor the session using a video system.

Baseline The subject was asked to relax while physiological measures were taken. Beginning in the baseline phase,

SBP, DBP, and HR were measured every 60th second for the duration of the experimental session. The baseline phase ended when a stable baseline was obtained (three consecutive SBP measures within 5 mm Hg, excluding the first reading) or when 18 minutes had passed. The mean length of the baseline period was 6.2 minutes (range = 4 to 18 minutes) and did not differ across the four experimental groups. Additionally, the length of the baseline phase did not correlate with SBP, DBP, or HR reactivity (defined as the increase above baseline levels).

Anticipation Phase After the baseline period, all subjects were told that when instructed to begin, they were to place their left hand in the water to a point about one inch above their wrist. The gender relevance of the CPT was then manipulated by the instructions used to introduce the CPT. Masculine-relevant CPT instructions were designed to emphasize the importance of good performance and physical fitness, characteristics of situations that men appraise as more stressful than do women (Eisler & Skidmore, 1987).

These subjects were instructed:

We want to know how long you are able to keep your hand in the ice water. Use your will-power to resist the temptation to pull your hand out for as long as you absolutely can. Try as hard as you can. Individuals in good physical condition do better at this. Good performance also reflects perseverance. We will be recording how long you are able to keep your hand in the water and your physiological responses.

In contrast, gender-neutral CPT subjects were told:

After you have placed your hand in the container of ice water, we would simply like you to keep your hand in the water until we are able to get proper physiological measurements. We will tell you when these are finished and when to remove your hand. We will be monitoring your physiological responses while you have your hand in the water in order to measure physical responses to cold.

Following these instructions, two BP and HR measures were completed. The anticipation phase lasted for 120 seconds. CPT Phase Next, the subject was instructed to place his or her left hand in the container of ice water. BP and HR were assessed when subjects had their hands in the water for 45 seconds ($\underline{M} = 45.3$ seconds, $\underline{SD} = 3.9$ seconds). Means did not differ across the experimental groups [$\underline{F}(3, 92) = 1.05$, $\underline{p} = .375$]. After 75 seconds, all subjects were asked to remove their hands and to sit quietly while additional measures were completed. One man and 10 women pulled their hands out of the water after the CPT measurement was completed, but before instructed to remove them. Six of the women were in the masculine-relevant CPT condition and four were in the neutral CPT condition. Since their recovery measures would be biased by this action, their data was not included in subsequent data analysis. These subjects' SBP, DBP, and HR during the CPT were lower than or equal to their group's mean in all cases. Thus, there was not a bias for more-reactive women to be excluded.

Recovery Phase BP and HR assessments were completed at 30, 90, 150, and 210 seconds after the CPT. Then the subject completed the appraisal scales before being debriefed and informed the final session would only involve assessment of resting BP and HR.

Return-day Baseline Assessment Subjects returned to the laboratory within one week at the same time of day for an assessment of BP and HR using the same baseline procedure. Return-day baselines are believed to minimize anticipatory arousal, resulting in a truer or more basal measure than preexperimental ones (see Obrist, 1981). The mean length of this baseline period was 5.9 minutes (range = 4 to 16 minutes) and did not significantly differ in length from the preexperimental baseline or between the experimental groups.

Data Reduction and Analysis

The mean of the last two physiological measures from each baseline period was defined as subject's baseline level for that period. Analyses of SBP, DBP, and HR baselines were conducted in a series of 2 (Sex) x 2 (CPT Condition) x 2 (Phase: Preexperimental baseline, Return-day baseline) repeated measures analyses of variance (ANOVA). Analyses of SBP, DBP, and HR reactivity were conducted in a series of 2 (Sex) x 2 (CPT Condition) x 7 (Phases: Anticipation 1, 2; CPT; Recovery 1, 2, 3, 4) repeated measures analyses of covariance (ANCOVA). The return-day

baseline levels of the dependent variables were covariates. Initially, these analyses included sex of experimenter as a fourth factor and subject's body mass (height/weight) as a second covariate. However, because no significant effects or interactions were found for sex of experimenter, and since body mass was not a significant covariate for any of the dependent measures, these variables were not included in the final analyses. The Huynh-Feldt adjustment was used to control for the violation of the assumption of homogeneity of variance common in trial data. Finally, a series of 2 x 2 ANOVAs on the appraisal ratings were performed.

Results - Study 1

Analysis of Physiological Data

Baseline

Contrary to the hypothesis that the return-day baselines would be lower than the preexperimental ones, they did not differ for SBP, DBP, or HR. The only significant difference was that men had higher baseline SBP than women [$F(1, 91) = 61.04, p < .001$].

SBP

Table 1 presents the mean SBP levels for the four experimental groups during baseline and each measurement during the anticipation, CPT, and recovery phases. The groups are graphically compared on CVR in Figure 1 in which SBP reactivity is represented as change from baseline to more clearly display group differences. The highest SBP readings were found for the first recovery measure which was completed just after subjects removed their hands from the water. This measure may be higher than during the CPT because subjects' SBP had not begun to recover from the CPT stress and the physical effort involved in moving their arms probably elevated their SBP further. Men showed greater SBP reactivity than women [$F(1, 90) = 17.78, p < .001$]. However, this effect was moderated by the predicted Sex X CPT Condition interaction [$F(1, 90) = 5.80, p = .009, \text{one-tailed}$]. Under the masculine-relevant CPT, men were more reactive than women [$F(1, 44) = 18.69, p < .001, \text{one-}$

tailed]. However, under the neutral CPT these groups did not differ [$F(1, 45) = 2.62, p = .113$]. The only other group difference was a CPT Condition X Phase interaction [$F(6, 540) = 2.34, p = .043$]. The masculine-relevant CPT produced greater SBP reactivity than the neutral CPT only during the CPT phase [$F(1, 92) = 12.81, p < .001$].

DBP

Mean DBP levels for the four groups are presented in Table 2 and they are graphically compared on DBP reactivity (expressed in change from baseline) in Figure 2. The predicted Sex X CPT Condition interaction was not found [$F(1, 90) = 0.33, p = .285, \text{one-tailed}$]. The only significant difference was that the masculine-relevant CPT produced greater DBP reactivity than the neutral CPT [$F(1, 90) = 4.89, p = .030$].

HR

Mean HR's for the four groups are presented in Table 3 and their HR reactivity (expressed in change from baseline) is displayed in Figure 3. The masculine-relevant CPT produced greater HR reactivity than did the neutral CPT [$F(1, 90) = 4.04, p = .047$]. However, this effect was moderated by the predicted Sex X CPT Condition interaction [$F(1, 90) = 3.87, p = .026, \text{one-tailed}$]. As seen in Figure 3, men showed greater HR reactivity than women during the anticipation, CPT, and recovery phases under the

masculine-relevant CPT, but not under the neutral CPT. Additionally, there was an effect for phase of the experiment [$F(6, 540) = 4.55, p = .004$]. However, this main effect was moderated by a CPT Condition X Phase interaction [$F(6, 540) = 5.13, p = .002$]. The masculine-relevant CPT produced greater HR reactivity during the first anticipation measure [$F(1, 92) = 5.67, p = .019$], the CPT [$F(1, 92) = 5.99, p = .016$], and the first recovery measure [$F(1, 92) = 7.14, p = .009$] than the neutral CPT.

Self-Reported Appraisal

The groups' mean self-reported appraisal ratings are indicated in Table 4. As can be seen on the ratings of how well men and women should perform, both men and women associated the masculine-relevant CPT with greater performance expectations for men than the gender-neutral CPT [$M = 5.4$ vs: $4.9; F(1, 91) = 5.99, p = .008$, one-tailed]. In contrast, women were not expected to perform any better on the masculine-relevant CPT than on the neutral CPT [$M = 4.4$ vs: $4.2; F(1, 91) = 0.80, p = .370$]. Additionally, the masculine-relevant CPT subjects, relative to gender-neutral CPT subjects, rated the task as more painful [$M = 4.1$ vs: $3.3; F(1, 91) = 7.22, p = .009$]. No group differences were found on ratings of challenge, discomfort, coping success, importance, or physical stress.

Table 1

Mean SBP (in mm Hg) for Men and Women as a Function of CPT Condition -
Study 1.

Phase	<u>Gender-Neutral CPT</u>		<u>Masculine-Relevant CPT</u>	
	Men	Women	Men	Women
Baseline				
Return-day	126.0 (12.0)	109.2 (7.0)	122.8 (10.3)	111.0 (8.6)
Preexperimental	123.1 (10.4)	110.8 (6.2)	123.1 (9.4)	109.8 (8.9)
Anticipation 1	128.6 (11.5)	111.8 (8.3)	130.9 (10.5)	113.2 (10.7)
" " 2	126.5 (13.4)	113.8 (14.0)	130.5 (10.8)	113.4 (12.6)
CPT	131.0 (10.1)	116.9 (6.7)	138.7 (10.3)	121.2 (9.3)
Recovery 1	143.0 (12.4)	124.5 (10.2)	144.9 (15.9)	122.4 (12.2)
" " 2	126.6 (13.0)	113.4 (8.2)	133.2 (11.8)	113.4 (8.1)
" " 3	122.8 (11.7)	111.6 (7.8)	127.6 (8.8)	109.6 (8.5)
" " 4	121.7 (11.5)	110.0 (6.2)	124.6 (9.6)	110.0 (7.5)

Note. The number in parentheses is the standard deviation.

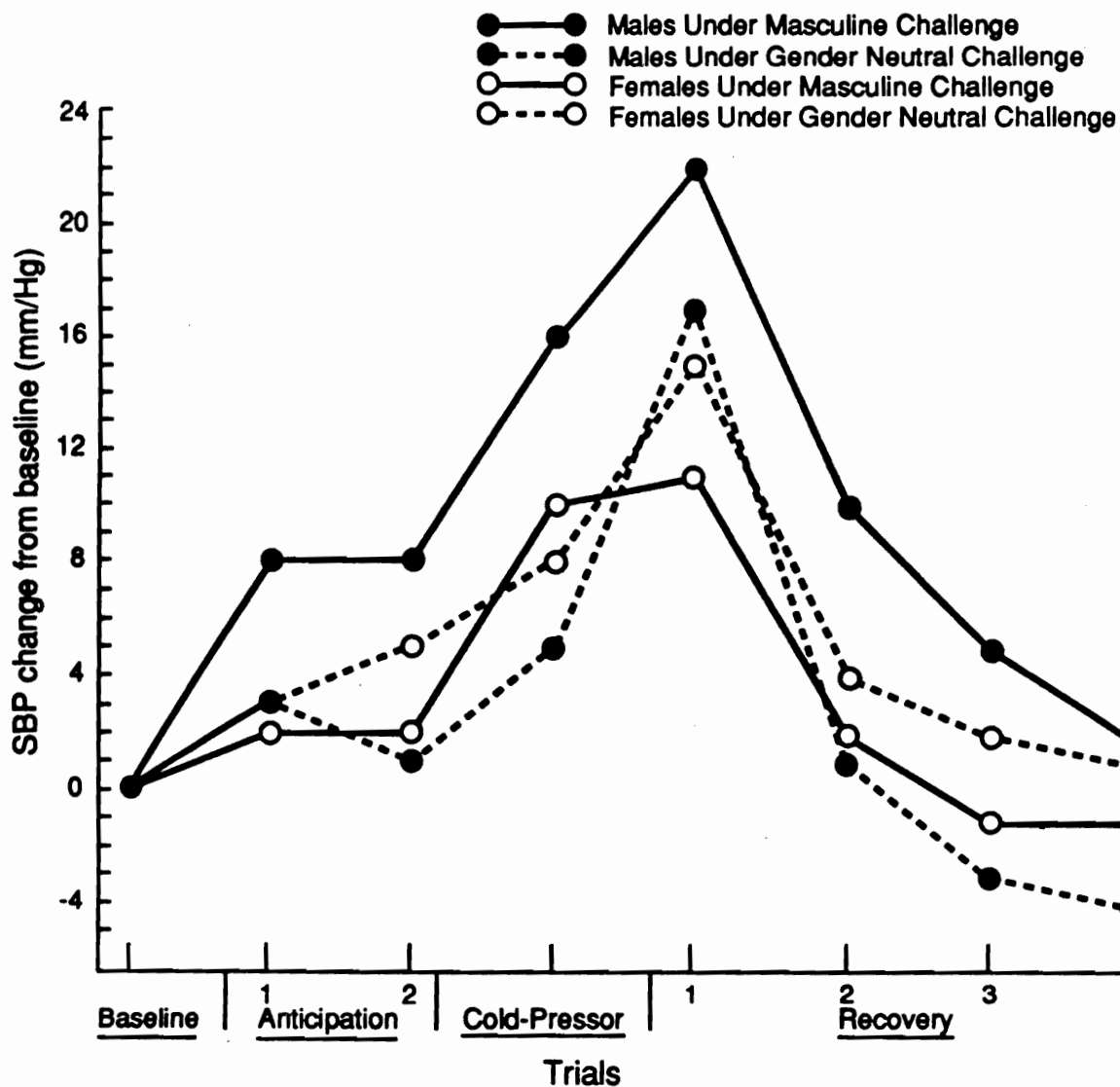


Figure 1. Mean SBP for the Four Experimental Groups During Each Stressor Phase.

Table 2

Mean DBP (in mm Hg) for Men and Women as a Function of CPT Condition -
Study 1.

Phase	Gender-Neutral CPT		Masculine-Relevant CPT	
	Men	Women	Men	Women
Baseline				
Return-day	67.5 (6.9)	68.5 (9.9)	68.4 (10.6)	68.8 (8.2)
Preexperimental	66.5 (7.3)	65.7 (7.0)	69.1 (9.2)	69.3 (8.1)
Anticipation 1	65.7 (9.3)	65.0 (9.0)	69.7 (16.0)	71.0 (9.8)
" " 2	65.1 (9.1)	69.5 (21.6)	68.3 (11.1)	74.0 (9.2)
CPT	77.3 (10.8)	77.6 (10.0)	76.2 (13.5)	83.1 (9.8)
Recovery 1	76.6 (14.8)	74.1 (11.9)	82.2 (20.9)	79.1 (14.6)
" " 2	65.3 (9.8)	66.4 (7.8)	69.2 (12.2)	71.9 (8.9)
" " 3	64.6 (9.1)	66.7 (7.6)	67.5 (12.4)	70.0 (10.3)
" " 4	65.6 (9.7)	66.1 (9.3)	68.9 (9.6)	69.6 (10.4)

Note. The number in parentheses is the standard deviation.

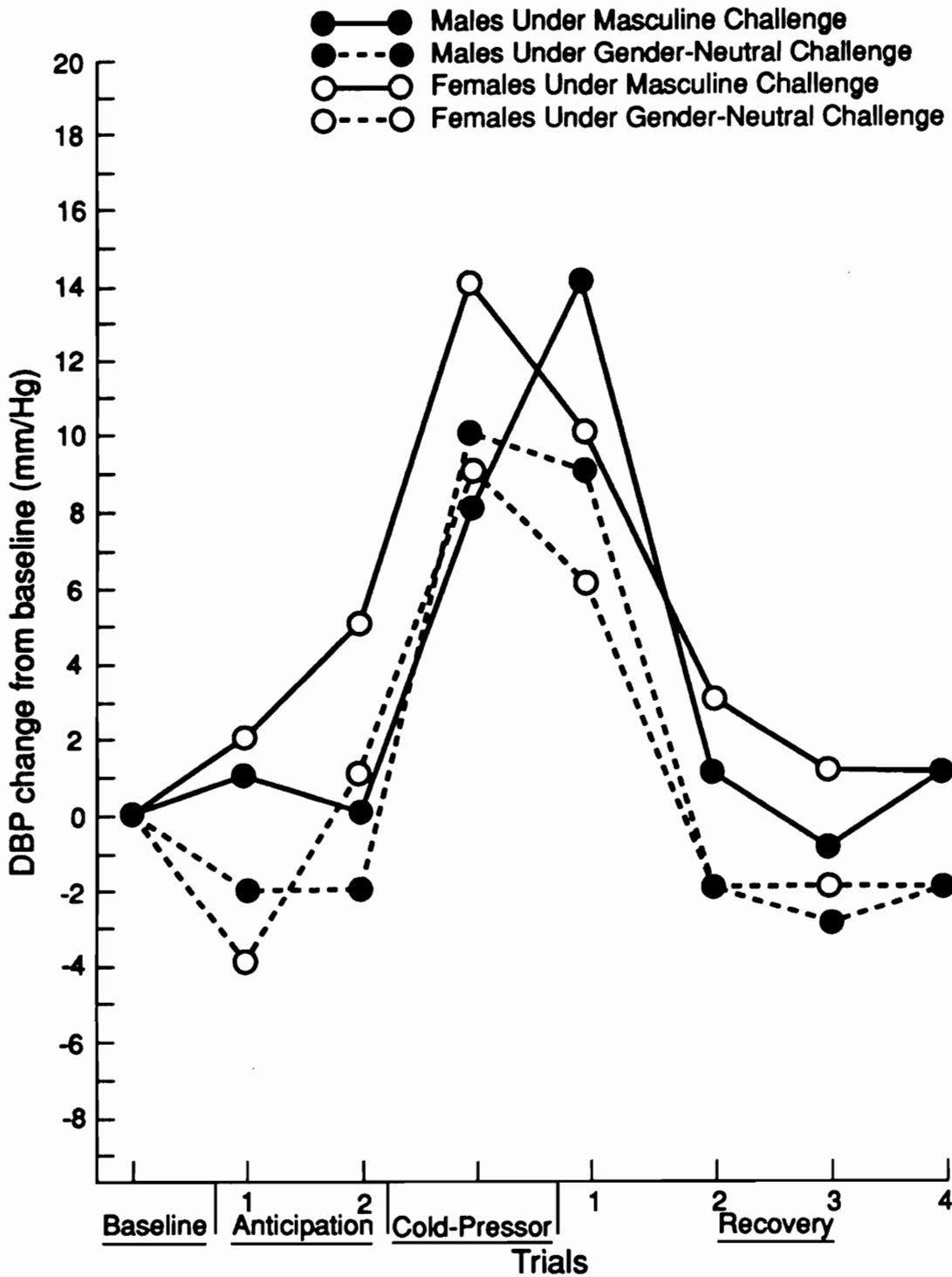


Figure 2. Mean DBP for the Four Experimental Groups During Each Stressor Phase.

Table 3.

Mean HR (in beats per minute) for Men and Women as a Function of CPT
Condition - Study 1.

Phase	<u>Gender-Neutral CPT</u>		<u>Masculine-Relevant CPT</u>	
	Men	Women	Men	Women
Baseline				
Return-day	76.3 (9.6)	77.1 (13.9)	74.9 (10.2)	81.9 (12.4)
Preexperimental	73.5 (10.0)	77.5 (12.9)	76.3 (11.8)	77.4 (13.1)
Anticipation 1	78.2 (13.2)	79.8 (14.9)	87.5 (14.1)	84.2 (11.3)
" " 2	72.7 (9.3)	76.4 (13.6)	78.6 (11.8)	80.0 (12.7)
CPT	79.1 (13.6)	84.2 (15.5)	94.3 (20.9)	86.9 (13.5)
Recovery 1	67.4 (10.3)	69.8 (11.8)	73.9 (13.7)	76.8 (13.5)
" " 2	70.3 (9.7)	75.0 (11.8)	72.3 (14.5)	75.6 (12.6)
" " 3	72.1 (10.2)	76.6 (12.4)	74.0 (12.4)	77.1 (12.0)
" " 4	71.8 (9.6)	75.0 (13.4)	76.4 (12.1)	76.6 (10.5)

Note. The number in parentheses is the standard deviation.

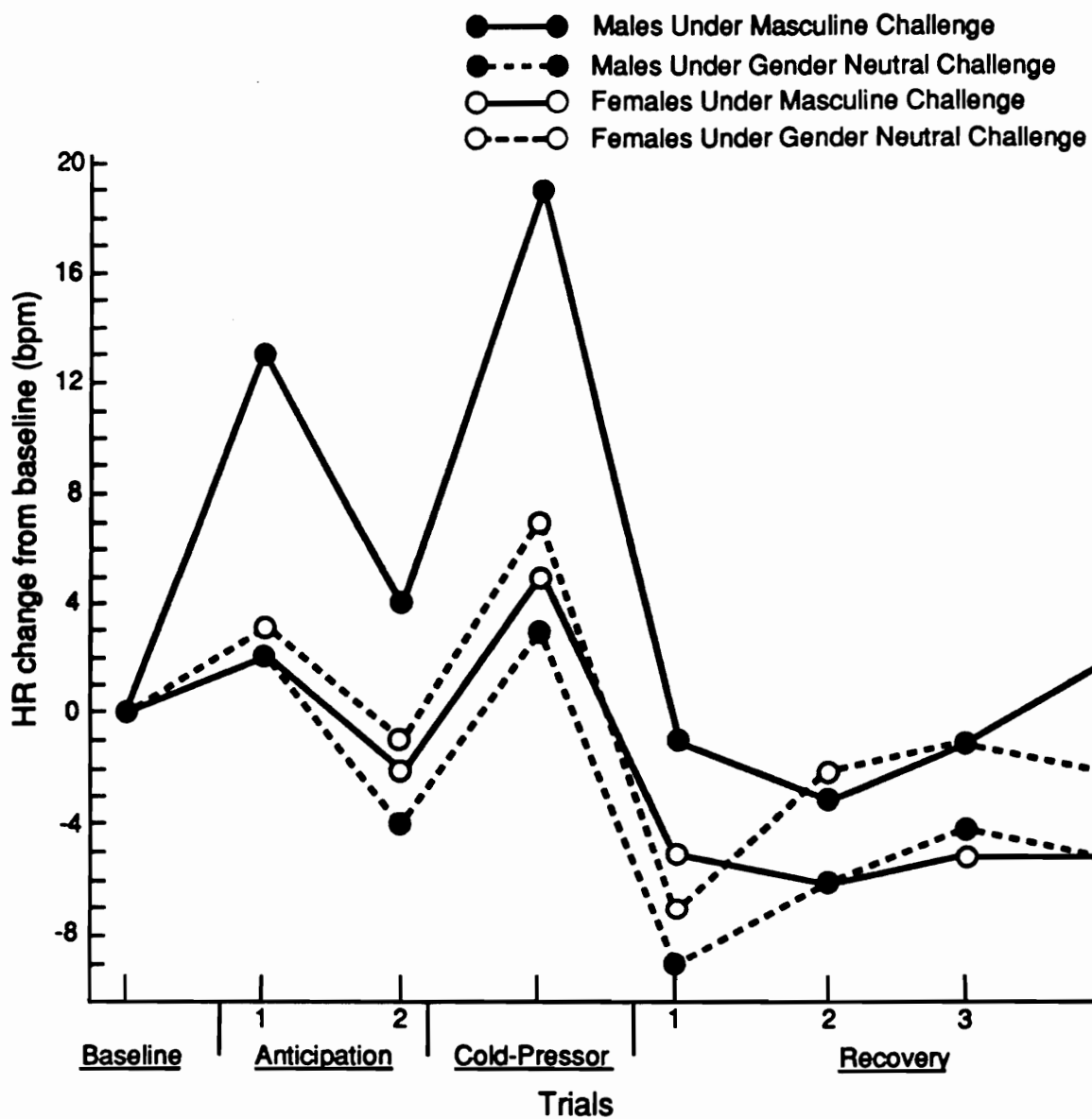


Figure 3. Mean HR for the Four Experimental Groups During Each Stressor Phase.

Table 4

Mean Appraisal Ratings for Men and Women as a Function of CPT Condition -
Study 1.

<u>Appraisal Items</u>	<u>Gender-</u>		<u>Masculine-</u>	
	<u>Neutral CPT</u>	<u>Relevant CPT</u>	<u>Men</u>	<u>Women</u>
How well will men do on this task?	5.1	4.7	5.4	5.4
How well will women do on this task?	4.2	4.2	4.2	4.6
How painful was this task?	4.3	3.9	3.3	3.3
How comfortable were you?	4.9	4.4	4.2	4.4
How well did you cope with this task?	2.3	2.0	1.8	2.2
How important was it that you do well?	4.7	4.0	4.9	4.4
How physically stressed were you?	4.4	4.5	4.1	4.2
How challenged or motivated were you to perform well?	4.7	4.2	5.1	4.8

Note: Each item was rated on a 7-point scale (0 to 6).

Discussion - Study 1

The results of the present study support the prediction that cognitive appraisal of the gender relevance of a stressor can mediate sex differences in CVR (Frankenhaeuser, 1983; Jorgensen & Houston, 1981; Polefrone & Manuck, 1987). Men showed greater CVR than women to the CPT when it was presented as a masculine-relevant task, but not when it was presented as a gender-neutral task. This pattern was found for SBP and HR reactivity across the anticipation, CPT, and recovery phases of the CPT. Although the pattern of results for DBP did not follow the predicted pattern, this is consistent with the conclusion that DBP reactivity infrequently distinguishes men and women (Saab, 1989; Stoney et al., 1987). One explanation of this null finding might be that DBP reactivity is less sensitive to the influence of cognitive appraisal of the stressor. However, other explanations may exist. Consistent sex differences across SBP, DBP, and HR reactivity are not always found (e.g., Matthews & Stoney, 1988).

However, it should be noted that another study completed while the present one was in progress failed to support a similar hypothesis. Matthews, Davis, Stoney, Owens, and Caggiula (1991) compared men and women on their CVR to mirror-image tracing and a color-word conflict test presented as masculine-relevant, feminine-relevant or gender-neutral tasks, but did not find predicted sex

differences in CVR as a function of how the tasks were presented. It is unclear why these studies are not in agreement. One possibility is that the within-subjects design used by Matthews and colleagues may have produced order effects that lessened the effect of their instructional manipulation. These discrepant findings indicate a need for replication of the present results.

The success of our manipulation of the gender relevance of the CPT was supported by the finding that the masculine-relevant CPT was appraised as a masculine task. Subjects reported greater performance expectations for men under the masculine-relevant CPT than under the neutral CPT. In contrast, performance expectations for women were not higher under the masculine-relevant CPT compared to the neutral CPT. Thus, the masculine-relevant CPT produced heightened performance expectations for men, but not women. However, we were unable to demonstrate that men, but not women, appraised the masculine-relevant CPT as being more stressful than the neutral CPT. A possible explanation of our failure to support these predictions is that self-report measures of appraisal may be less sensitive to group differences than are CVR measures (see Strube, 1989). Nonetheless, these results leave open the possibility that the appraised gender relevance of the CPT was not manipulated as intended. Both men and women may have appraised the masculine-relevant CPT

as more stressful than the neutral CPT whereas only men responded to these heightened appraisals with enhanced SBP and HR reactivity. However, the self-report data fail to support this alternative since neither men nor women were shown to appraise the masculine-relevant CPT as more stressful or challenging than the neutral CPT.

The present findings are consistent with a cognitive appraisal conceptualization of gender differences in CVR. Men are not always more reactive than women, but only show greater CVR to masculine-relevant stressors. This view of sex differences in CVR also suggests that women should show greater CVR to feminine-relevant stressors. To test this hypothesis and to replicate the present findings a second study was conducted to compare the CVR of men and women to the CPT presented as a masculine-relevant and as a feminine-relevant task. Consistent with the present results, under the masculine-relevant CPT men are predicted to show greater CVR than women. In contrast, under the feminine-relevant CPT, women are predicted to show greater CVR than men.

In the second study two additional measures will be included in order to provide a more sensitive manipulation check. First, a self-report measure of emotional reactions shown to be sensitive to differences in cognitive appraisal of stressors was included. Under the masculine-relevant

CPT, men should report stronger emotional challenge and threat responses than women. The exact opposite pattern should emerge under the feminine-relevant CPT. Second, the length of time subjects were allowed to keep their hands in the ice water will be increased in order to increase the variability in the number of subjects who pull their hands out of the water prior to the maximum CPT time. This will provide a behavioral measure of effort subjects placed in CPT performance. Under the masculine-relevant CPT it was predicted that more men than women would keep their hands in the water until told to remove them as a result of the increased appraisal of masculine challenge. In contrast it was predicted that more women than men would keep their hands in the water the full length of time under the feminine-relevant CPT as a result of the increased appraised feminine challenge.

Method - Study 2

Subjects

One hundred forty-six introductory psychology students at Virginia Tech were screened for participation. Twenty-five students were eliminated from the final sample due to medical problems ($N = 15$), failure report for their CPT session appointment twice ($N = 2$), lost data resulting from equipment related problems ($N = 3$), failure to keep their hands in the ice water until the first BP measurement was completed ($N = 2$), or awareness of the experimental hypothesis ($N = 3$).

The final sample consisted of 121 medication-free, normotensive subjects who ranged in age from 18 to 30 years ($M = 18.8$ years). Mean values for height and weight for men (167.2 pounds and 70.8 inches, respectively) were significantly greater than those for women (133.4 pounds and 65.2 inches, respectively). Subjects were randomly assigned to the male-relevant or the feminine-relevant CPT using a random number table. Twenty-eight men and 33 women participated in the masculine-relevant CPT condition while 31 men and 29 women participated in the feminine-relevant CPT condition.

Apparatus and Measures

The same apparatus and measures as in Study 1 were employed, and the ice water was again maintained at 4 °C. The Experimental Experiences Scale was modified to include a

measure of emotional responses reflecting appraisal of threat and challenge (see Appendix F). Subjects rated on 7-point scales (0 to 6) the degree to which they experienced 15 different emotions. These items were taken from Folkman and Lazarus's (1985) Stress Questionnaire. Ratings for items in each subscale are summed and then divided by the number of items in the subscale to produce measures of anticipatory threat (i.e., worried, fearful, and anxious), anticipatory challenge (i.e., confident, hopeful, and eager), outcome harm (i.e., anger, sad, disappointed, guilty, and disgusted), and outcome benefit emotions (i.e., exhilarated, pleased, happy, and relieved). Each of these scales is reported to have good internal consistency (Folkman & Lazarus, 1985).

Experimental Design

BP and HR were assessed during baseline, anticipation, CPT, and recovery phases of the experiment. Mean responses during these phases were compared in a series of 2 (Sex) X 2 (CPT Condition: Masculine-relevant vs. Feminine-relevant) factorial designs. Since CVR was assessed during several phases, a repeated measures factor was also included.

Procedure

The procedure employed in study 1 was repeated except for the following changes. Since sex of experimenter did not have a significant effect in the first study, subjects

were not randomly assigned to a male or female experimenter. Four female and one male experimenters administered the laboratory procedure. Instead, the subjects were randomly assigned to receive taped CPT instructions delivered by a either a male or a female speaker. The experimental data sheet utilized by the experimenters was updated to match the modified procedure (see Appendix G). As in study 1, subjects who failed to abstain from caffeine and alcohol for eight hours, or from tobacco for one hour prior to the CPT session were rescheduled. Additionally, subjects who did not abstain from exercise for eight hour prior to this session were rescheduled.

Baseline The only variation in the introduction and baseline period procedure was that rather than stepping behind a partition to monitor the subject during the experiment, the experimenter observed the session from a separate room. The mean length of the baseline period was 5.9 minutes (range = 4 to 15 minutes) and did not differ across the four experimental groups. Additionally, the length of the baseline phase did not correlate with SBP, DBP, or HR reactivity (defined as the increase above baseline levels).

Anticipation Phase The gender relevance of the CPT was manipulated using different instructions. The feminine-relevant CPT instructions were designed to indicate good

performance is related to levels of female sex hormones, and reflects ability to nurture and to form intimate relationships. Evaluations of these abilities are characteristic of situations that women appraise as more stressful than do men (Gillespie & Eisler, in press).

Feminine-relevant CPT subjects were instructed:

Some researchers believe that ability to keep your hand in the water is improved by high levels of female sex hormones such as estrogen and progesterone. These hormones are involved in physically coping with this task and appear to be the same that allow women to deal with the stress of childbirth. High levels of estrogen and progesterone have been proposed to increase maternal bonding with children after birth. Besides childbirth and maternal bonding, they may be associated with increased emotional bonding with others. So, being able to keep your hand in the water suggests you have high levels of estrogen and progesterone which predict ability to be emotionally supportive of others as well as to be able to bond and form emotionally close relationships with others. We will tell you to begin in just one minute.

In contrast the masculine-relevant CPT instructions were designed to indicate that good performance is related to levels of the male sex hormone testosterone, and reflects characteristics of physical fitness and willpower. Evaluations of these characteristics are typical of situations that men appraise as more stressful than do women (Eisler & Skidmore, 1987). These instructions were altered from these masculine-relevant CPT instructions used in study 1 in order to make them parallel in form to those designed for the feminine-relevant CPT instructions.

Masculine-relevant CPT subjects were instructed:

Some researchers believe that ability to keep your hand in the water is improved by high levels of the male sex hormone testosterone. This hormone is involved in physically coping with this task. In addition to your physiological responses, one thing this test will show us is how long you are able to keep your hand in the water. Use your willpower to resist the temptation to pull your hand out for as long as you absolutely can. Try as hard as you can. It appears that individuals in good physical condition do better at this. Good performance also reflects perseverance. So, being able to keep your hand in the water suggests you have high levels of testosterone which predicts good performance. We will be recording how long you are able to keep your hand in the water. We will tell you to begin in just one minute.

Following these instructions, three BP and HR measures, one more than in study 1, were completed. The anticipation phase lasted for 180 seconds.

CPT Phase The maximum amount of time for which subjects could keep their hands in the ice water was extended from 75 seconds to 120 seconds. Assessment of BP and HR were completed when subjects had their hands in the water for 41.9 seconds (SD = 4.5 seconds) and 100.1 seconds (SD = 4.3 seconds). These mean times did not differ across the experimental groups. Two subjects pulled their hands out of the water prior to the first CPT measurement while 33 additional subjects did so prior to second one. Since their recovery experience was different from those subjects who did not pull their hands out early, their data was not included in subsequent physiological data analysis unless

otherwise noted.

Recovery Phase During the recovery phase only two BP and HR measures were completed (30 and 90 seconds after the CPT). Then the subject completed the revised version of the Experimental Experiences Scale.

Return-day Baseline Assessment This baseline procedure differed from that in study 1 in that the definition of a stable baseline was changed to three consecutive SBP measures within 5 mg Hg excluding the first four readings rather than just the first reading. Thus, a longer resting period was used prior to assessment of baselines than in study 1 or in the preexperimental baseline. The mean length of this baseline period was 8.7 minutes (range = 7 to 15 minutes) which was longer than the preexperimental baseline [$F(1, 115) = 85.74, p < .001$].

Data Reduction and Analysis

The data reduction and analysis was preformed as in study 1 except for the following changes. The mean of the last three physiological measures from each baseline period, rather than the last two, was defined as subjects' baseline level. The comparisons of SBP, DBP, and HR reactivity were conducted in a series of 2 (Sex) x 2 (CPT Condition) x 7 (Phases: Anticipation 1, 2, 3; CPT 1, 2; Recovery 1, 2) repeated measures ANCOVA. The change in the ANCOVA reflects an extra measure during both the anticipation and the CPT

phase, and two fewer measures during the recovery phase. Again return-day baseline levels of the dependent variables were covariates. Initially, these analyses included sex of the speaker delivering the CPT instructions as a fourth factor and subject's body mass (height/weight) as a second covariate in the ANCOVA. However, since no significant effects or interactions were found for sex of the speaker, and body mass was not a significant covariate for any of the dependent measures, these variables were not included in the final analyses.

Results - Study 2

Analysis of Physiological Data

Baseline

The return-day SBP baseline (115.2) was lower than the preexperimental baseline (117.0) [$F(1, 117) = 7.46$, $p = .007$]. However, since the procedures for assessing baseline differed for the preexperimental and return-day baselines, it is unclear whether they differed because return-day baselines are lower as predicted by Obrist (1981), or as a result of the procedural difference. For DBP a nonsignificant trend supported the same conclusion: the return-day and preexperimental means were 68.0 and 69.2, respectively [$F(1, 117) = 3.86$, $p = .052$]. In contrast the return-day HR baseline (76.6) did not differ from the preexperimental HR baseline (75.6). In agreement with study 1, mean values for SBP were higher for men, 122.7, than for women 109.8 [$F(1, 117) = 64.64$, $p < .001$]. However, this main effect was qualified by a Sex X CPT condition interaction [$F(1, 117) = 5.77$, $p = .018$]. Although men had greater baseline SBP than women under both the masculine-relevant and the feminine-relevant CPT condition, this difference was greater under the feminine-relevant CPT (124.3 vs. 107.5) than the masculine-relevant CPT (121.0 vs. 111.9). No other group differences were found.

SBP

Table 5 presents the mean SBP levels for the four

experimental groups during baseline and each measurement during the anticipation, CPT, and recovery phases. The groups are graphically compared on SBP reactivity in Figure 4 (expressed in change from baseline). The predicted Sex X CPT Condition interaction was found [$F(1, 83) = 3.81$, $p = .027$, one-tailed]. Under the masculine-relevant CPT, men were more reactive than women [$F(1, 40) = 3.72$, $p = .030$, one-tailed]. Under the feminine-relevant CPT, women were more reactive than men [$F(1, 42) = 3.13$, $p = .042$, one-tailed]. The only other significant difference was a Sex X Phase interaction [$F(6, 498) = 3.48$, $p = .013$]. Men were more reactive than women only at the first recovery reading [$F(1, 83) = 7.21$, $p = .009$].

The above results were also found when analyzed to include those who pulled their hands out of the water prior to the maximum time allowed (except the two who had pulled their hands out prior to the first CPT reading). Again, the predicted Sex X CPT Condition was found [$F(1, 116) = 4.18$, $p = .022$, one-tailed]. Under the masculine-relevant CPT, men were more reactive than women [$F(1, 58) = 6.77$, $p = .006$, one-tailed] and under the feminine-relevant CPT, women were more reactive than men [$F(1, 57) = 4.37$, $p = .021$, one-tailed].

DBP

Mean DBP levels for the four groups are presented in

Table 6. The groups are graphically compared on DBP reactivity in Figure 5 (expressed in change from baseline). As with SBP, the predicted Sex X CPT Condition was found [$F(1, 83) = 6.77$, $p = .006$, one-tailed]. Under the masculine-relevant CPT men and women did not differ in reactivity [$F(1, 40) = 0.43$, $p = .259$, one-tailed]. Under the feminine-relevant CPT, women were more reactive than men [$F(1, 42) = 8.54$, $p = .003$, one-tailed]. There were no other significant group differences.

Again, the above results were found when analyzed to include those who pulled their hands out of the water early (except the two who had pulled their hands out prior to the first CPT reading). The predicted Sex X CPT Condition was found [$F(1, 116) = 3.15$, $p = .039$, one-tailed]. Under the masculine-relevant CPT, men and women did not differ on DBP reactivity [$F(1, 58) = 0.02$, $p = .447$, one-tailed]. Under the feminine-relevant CPT, women were more reactive than men [$F(1, 57) = 5.19$, $p = .013$, one-tailed].

HR

Mean HR's for the four groups are presented in Table 7 and their HR reactivity is displayed in Figure 6 (expressed in change from baseline). No significant group differences for HR reactivity were observed [Sex X CPT Condition interaction effect, $F(1, 83) = 0.41$, $p = .262$, one-tailed].

Self-Reported Appraisal

The groups' mean self-reported appraisal ratings are indicated in Table 8. In support of the prediction that the masculine-relevant CPT would be perceived as a masculine task, ratings of how well men and women should perform on the CPT indicated that men and women expected men to perform better under the masculine-relevant CPT than under the feminine-relevant CPT [$\underline{M} = 5.6$ vs. 4.4 ; $\underline{F}(1, 113) = 20.48$, $p < .001$, one-tailed]. Similarly, men and women expected women to perform better under the feminine-relevant CPT than under the masculine-relevant CPT [$\underline{M} = 5.1$ vs. 4.4 ; $\underline{F}(1, 113) = 12.98$, $p < .001$, one-tailed].

On threat emotions the predicted Sex X CPT Condition interaction was found [$\underline{F}(1, 110) = 3.41$, $p = .034$, one-tailed]. Under the masculine-relevant CPT, we failed to show that men perceived greater threat than women as had been predicted [($\underline{M} = 2.7$, $\underline{F}(1, 57) = 1.00$, $p = .161$, one-tailed)]. However, as predicted under the feminine-relevant CPT, women perceived more threat than men ($\underline{M} = 2.6$ vs. 2.3 , $\underline{F}(1, 54) = 2.45$, $p = .062$, one-tailed].

On challenge emotions the predicted Sex X CPT Condition interaction was also found [$\underline{F}(1, 110) = 6.76$, $p = .005$, one-tailed]. Under the masculine-relevant CPT, men perceived more challenge than women ($\underline{M} = 3.6$ vs. 3.2 , $\underline{F}(1, 57) = 4.98$, $p = .015$, one-tailed]. Under the feminine-relevant CPT, a

trend suggested women perceived more challenge than men ($\underline{M} = 3.8$ vs. 3.4 , $F(1, 53) = 2.20$, $\underline{p} = .072$, one-tailed].

Neither the predicted Sex X CPT Condition interactions, nor other group differences, were found for outcome benefit ($\underline{M} = 2.9$) and outcome harm ($\underline{M} = 1.3$) emotions. Similarly, no group differences were found on CPT ratings of challenge ($\underline{M} = 4.8$), threat ($\underline{M} = 1.8$), importance ($\underline{M} = 4.3$), physical stress ($\underline{M} = 2.4$), relaxation ($\underline{M} = 5.0$), comfort ($\underline{M} = 5.0$), or effort ($\underline{M} = 5.0$).

Behavioral Responses to the CPT

The number of subjects who pulled their hands out of the water prior to being instructed to is indicated in Table 9. As predicted more men than women kept their hands in the water for the maximum time allowed (two minutes) under the masculine-relevant CPT condition [$\underline{X}^2(1, \underline{N} = 61) = 3.38$, $\underline{p} = .033$, one-tailed]. However, in contrast to the prediction, more women than men did not keep their hands in the water under the feminine-relevant CPT condition [$\underline{X}^2(1, \underline{N} = 62) = 0.20$, $\underline{p} = .328$, one-tailed].

Table 5

Mean SBP (in mm Hg) for Men and Women as a Function of CPT Condition -
Study 2.

Phase	Feminine-Relevant CPT		Masculine-Relevant CPT	
	Men	Women	Men	Women
Baseline				
Return-day	124.3 (8.9)	105.9 (7.7)	119.7 (11.8)	111.1 (8.6)
Preexperimental	124.3 (8.2)	109.0 (7.8)	122.2 (13.0)	112.6 (9.7)
Anticipation 1	125.9 (9.8)	113.0 (7.4)	126.9 (14.2)	117.9 (11.0)
" " 2	125.2 (7.3)	112.4 (6.9)	128.5 (16.3)	119.8 (12.7)
" " 3	125.0 (10.5)	112.3 (7.4)	126.7 (16.3)	116.6 (11.9)
CPT 1	132.2 (10.5)	118.8 (6.8)	136.1 (16.2)	124.0 (13.7)
" " 2	140.8 (11.6)	125.5 (8.6)	146.0 (17.7)	131.3 (15.7)
Recovery 1	138.2 (10.8)	122.0 (10.9)	142.5 (18.4)	124.2 (15.2)
" " 2	127.4 (9.9)	113.5 (7.2)	129.5 (15.1)	117.6 (10.4)

Note. The number in parentheses is the standard deviation.

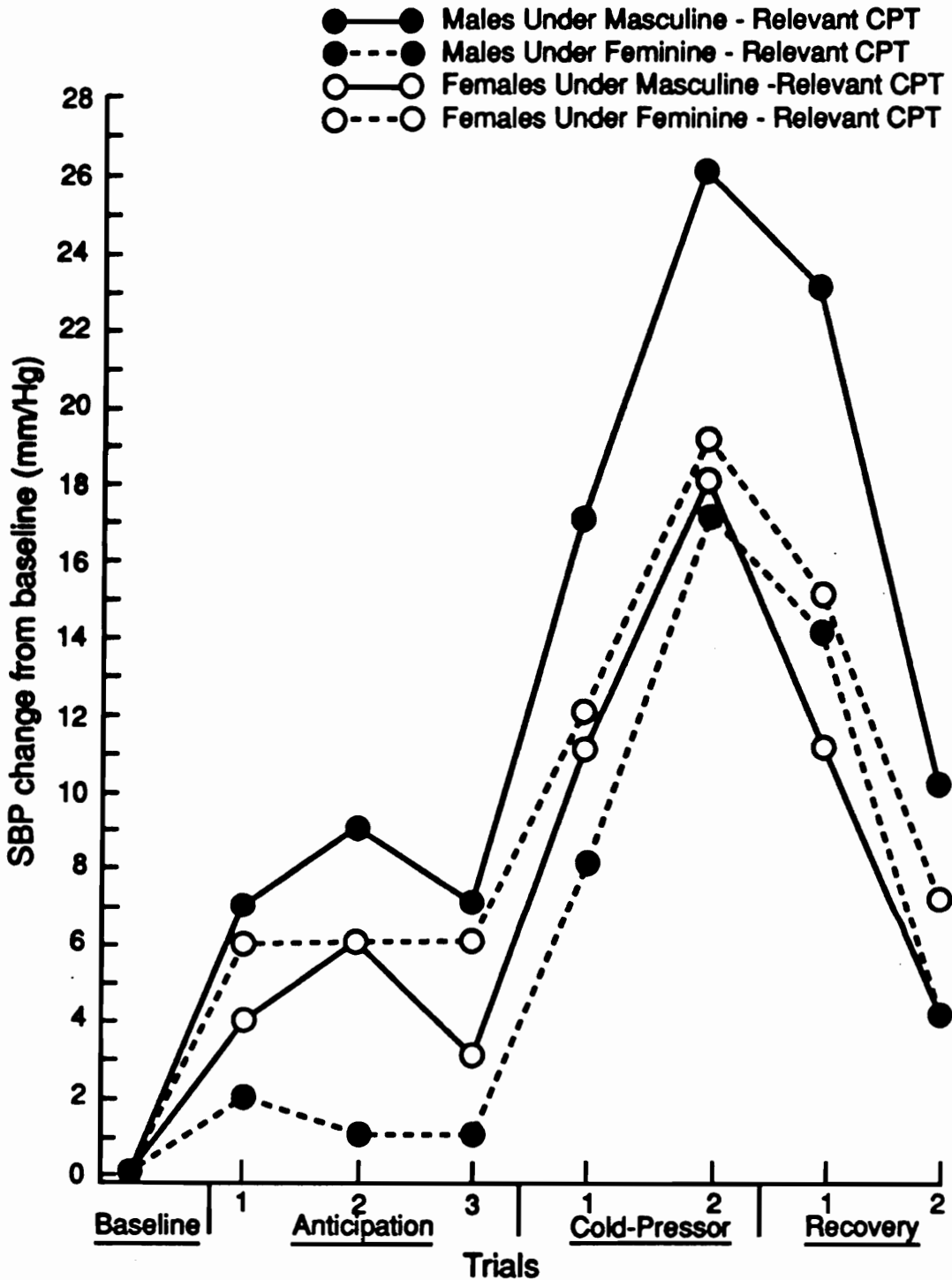


Figure 4. Mean SBP for the Four Experimental Groups During Each Stressor Phase.

Table 6

Mean DBP (in mm Hg) for Men and Women as a Function of CPT Condition -
Study 2.

Phase	Feminine-Relevant CPT		Masculine-Relevant CPT	
	Men	Women	Men	Women
Baseline				
Return-day	67.0 (8.5)	66.9 (7.7)	68.9 (9.4)	69.2 (9.2)
Preexperimental	67.5 (7.3)	70.0 (6.9)	70.0 (8.5)	69.5 (7.4)
Anticipation 1	65.8 (11.0)	73.7 (7.6)	71.1 (10.2)	73.1 (9.1)
" " 2	65.6 (9.8)	72.8 (8.5)	68.7 (9.3)	74.3 (7.8)
" " 3	66.3 (9.3)	72.0 (7.8)	71.6 (13.6)	71.7 (9.6)
CPT 1	73.0 (11.2)	81.7 (7.5)	80.0 (16.4)	79.4 (10.7)
" " 2	82.2 (12.0)	88.5 (9.1)	88.8 (9.3)	85.8 (16.5)
Recovery 1	74.3 (12.3)	80.0 (8.2)	77.3 (9.1)	74.4 (9.9)
" " 2	65.7 (10.5)	73.0 (7.6)	71.9 (10.9)	70.6 (8.3)

Note. The number in parentheses is the standard deviation.

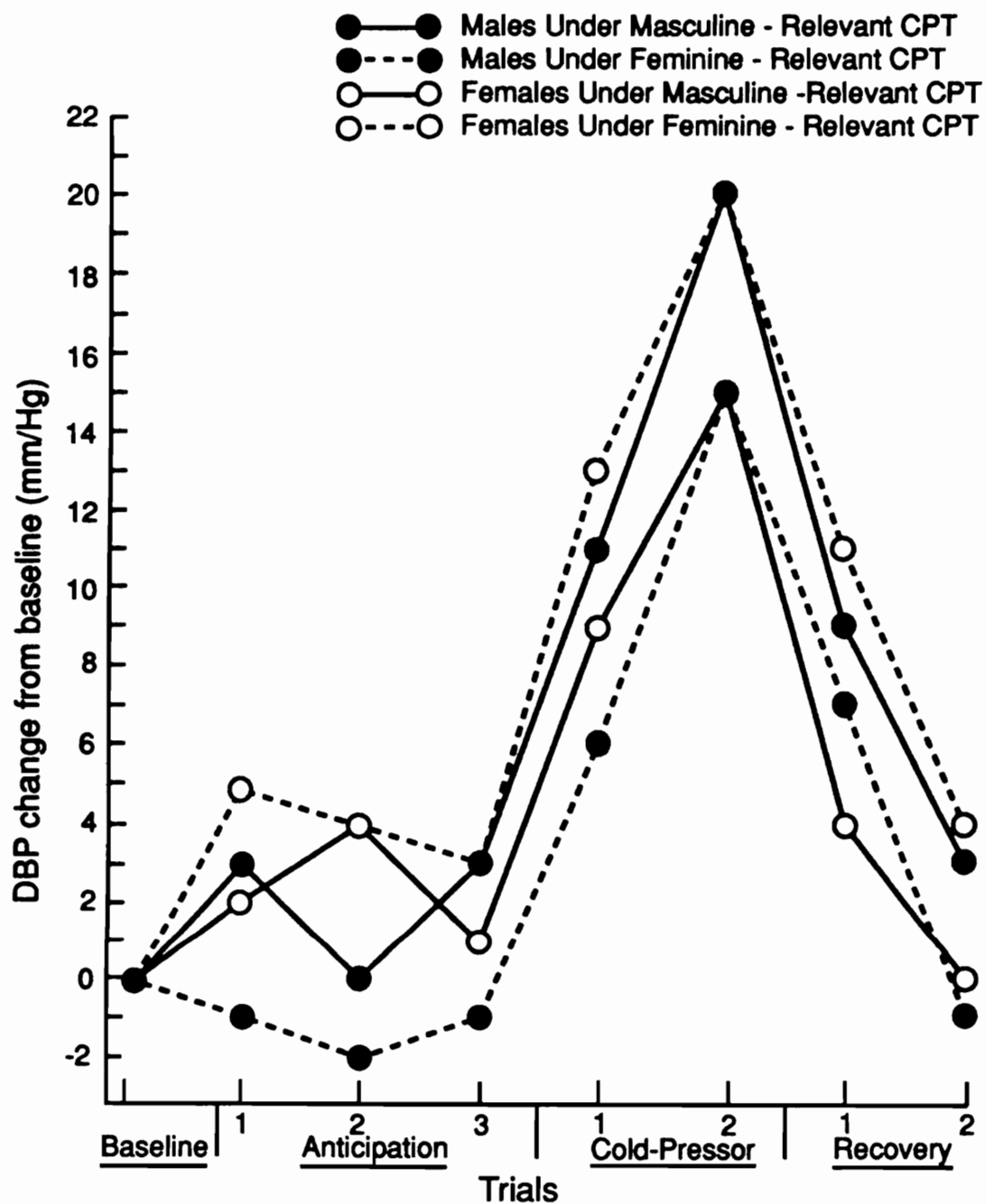


Figure 5. Mean DBP for the Four Experimental Groups During Each Stressor Phase.

Table 7

Mean HR (in beats per minute) for Men and Women as a Function of CPT
Condition - Study 2.

Phase	Feminine-Relevant CPT		Masculine-Relevant CPT	
	Men	Women	Men	Women
Baseline				
Return-day	74.9 (9.5)	78.7 (7.3)	75.2 (11.8)	77.7 (11.0)
Preexperimental	75.1 (12.1)	77.3 (10.3)	74.2 (12.0)	75.7 (9.8)
Anticipation 1	82.2 (12.5)	86.0 (12.1)	84.8 (16.3)	86.2 (14.5)
" " 2	78.2 (13.7)	81.6 (10.1)	81.3 (13.6)	83.3 (15.7)
" " 3	77.4 (11.6)	80.9 (10.0)	80.7 (11.8)	77.2 (13.1)
CPT 1	84.2 (13.6)	86.1 (11.1)	86.9 (14.7)	88.2 (14.4)
" " 2	78.3 (14.0)	83.6 (11.0)	79.6 (13.3)	81.6 (11.6)
Recovery 1	69.5 (10.0)	75.3 (10.2)	69.1 (13.7)	72.9 (10.9)
" " 2	76.1 (11.9)	77.9 (13.3)	72.1 (13.1)	75.1 (12.7)

Note. The number in parentheses is the standard deviation.

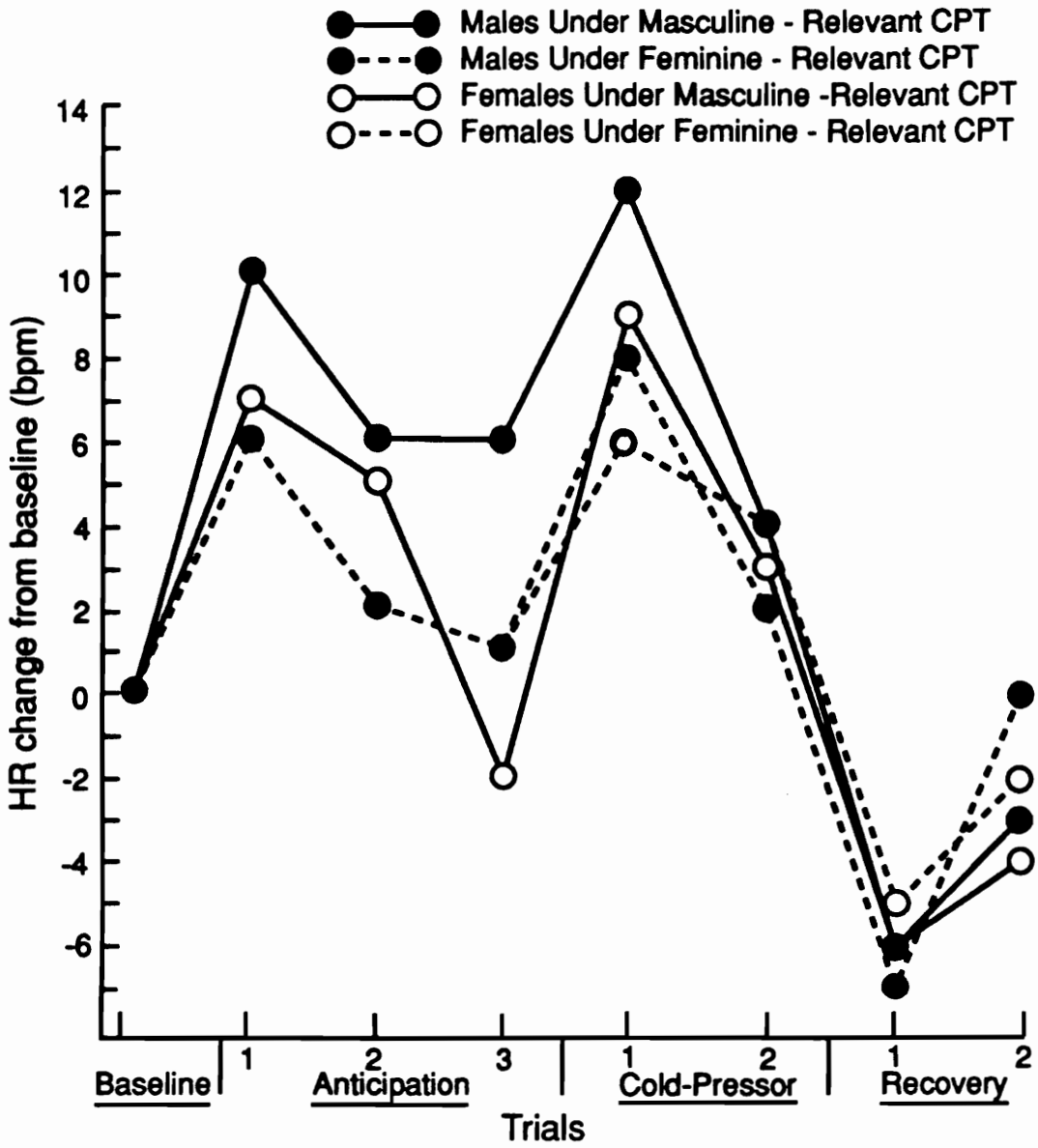


Figure 6. Mean HR for the Four Experimental Groups During Each Stressor Phase.

Table 8

Mean Appraisal Ratings for Men and Women as a Function of CPT Condition -
Study 2.

<u>Appraisal Items</u>	<u>Feminine-</u>		<u>Masculine-</u>	
	<u>Men</u>	<u>Women</u>	<u>Men</u>	<u>Women</u>
How well will men do on this task?	3.8	2.9	4.7	4.5
How well will women do on this task?	3.9	4.4	3.3	3.4
How challenged or motivated were you to perform well?	3.7	4.1	3.8	3.7
How threatened were you by this interview?	0.7	0.6	0.8	1.0
How important was it that you do well?	2.8	3.7	3.4	3.3
How stressed were you?	1.3	1.4	1.5	1.6
How relaxed were you?	4.3	4.1	3.7	3.8
How comfortable were you?	4.3	4.0	3.9	3.9
How much effort did you put into performing well?	3.3	4.6	4.1	4.0
Challenge Emotions	3.4	3.8	3.6	3.2
Threat Emotions	2.3	2.6	2.5	2.8
Outcome Benefit Emotions	3.0	3.1	2.9	2.6
Outcome Harm Emotions	1.3	1.4	1.3	1.3

Note: Each item was rated on a 7-point scale (0 to 6).

Table 9

Number of Subjects Who Kept Hands in the Water for the Entire CPT Period as a Function of CPT Condition - Study 2.

	CPT Condition			
	Feminine-Relevant		Masculine-Relevant	
	Men	Women	Men	Women
Number of Subjects	32	30	28	33
Number Completing CPT	24	21	23	20
Percentage Completing CPT	75.0%	70.0%	82.1%	60.6%
Mean Time in Water (in seconds)	118.6	108.9	114.4	107.0

Discussion - Study 2

The results of the second study replicate the first study, providing further support for the hypothesis that cognitive appraisal of the gender relevance of a stressor can mediate sex differences in CVR. As in the first study men showed greater SBP reactivity than women to the CPT when it was presented as a masculine-relevant task. Additionally, women showed greater SBP and DBP reactivity than men when it was presented as a feminine-relevant task. This pattern was found across the anticipation, CPT, and recovery phases of the stressor. Although the pattern of results for HR reactivity did not support the hypothesis as it did in the first study, inconsistent sex differences across SBP, DBP, and HR reactivity are often found.

The finding of greater SBP reactivity among women than men is particularly noteworthy. In previous studies women have shown greater DBP, HR, and neuroendocrine reactivity than men to apparently feminine-relevant stressors. However, the present study is the first known study to demonstrate greater SBP reactivity among women than men.

The success of the manipulation of the gender relevance of the CPT was supported by the finding that the masculine-relevant and the feminine-relevant CPT's were appraised as masculine-relevant and feminine-relevant tasks, respectively. Subjects reported greater performance expectations for men under the masculine-relevant than under

the feminine-relevant CPT. In contrast, subjects reported greater performance expectations for women under the feminine-relevant than under the masculine-relevant CPT. Thus, the masculine-relevant CPT produced heightened performance expectations for men while the feminine-relevant CPT produced heightened performance expectations for women. Additionally, other self-report measures supported the manipulation of the gender relevance of the CPT. In response to the masculine-relevant CPT, men reported more challenge emotions than women while under the feminine-relevant condition women reported greater challenge and threat emotions than men. Similarly more men than women kept their hands in the ice water for the full time under the masculine-relevant CPT condition. However, the number of women and men who kept their hands in the ice water under the feminine-relevant CPT condition did not differ and men did not report more threat emotions under the masculine-relevant CPT than did women. Also, predicted differences on self-reported emotional harm and benefit emotions were not found. Finally, as in the first study, predicted differences on seven self-report items reflecting appraised challenge and stress involved in the CPT task were not found.

The present manipulation check provides support that the appraised gender relevance of the CPT was manipulated as

intended. Although a number of null findings exist, self-report appraisal and emotional responses, as well as a behavioral measure, provide support for the idea that men appraised the masculine-relevant CPT as more stressful than did women while women appraised the feminine-relevant CPT as more stressful than did men.

Additionally, the findings of greater reactivity among women than men to the feminine-relevant CPT argue against the possibility that sex differences in CVR are due to greater reactivity to appraised challenge in men than women. In discussion of study one it was mentioned that an alternative explanation of those results was that both men and women may have appraised the masculine-relevant CPT as more stressful than the neutral CPT while only men responded to these heightened appraisals with enhanced reactivity. If this were the case, women would never show greater CVR than men. The present results can only be interpreted as a function of sex differences in cognitive appraisal, rather than sex differences in response to the same appraisal. Men were more reactive to the CPT when it was presented as a masculine-relevant stressor while women were more reactive to it when it was presented as a feminine-relevant stressor.

General Discussion

The role of cognitive appraisal in sex differences in CVR has been suggested by reviews of the CVR literature

documenting a Sex X Situation interaction in CVR across studies and different stressors. Men have often shown greater CVR than women to apparently masculine-relevant stressors while women have sometimes shown greater CVR than men to apparently feminine-relevant stressors. In the present studies, we directly examined the effect of the gender relevance of the stressor by manipulating a single stressor's gender relevance. They are the first known studies to demonstrate that cognitive appraisal of the stressor determines sex differences in CVR. Men showed greater SBP and HR reactivity to the CPT presented as a masculine-relevant stressor while women showed greater SBP and DBP reactivity to it when it was presented as a feminine-relevant stressor. In contrast, no sex differences in CVR were found when the CPT was presented as a gender-neutral challenge. Additionally, we demonstrated this effect as a result of the instructional manipulation alone, prior to actual CPT exposure during the anticipation phase.

Much of the emphasis in the study of CVR has been toward identifying a trait of CVR on which individuals are defined as hyperreactors or hyporeactors. According to this conceptualization, the increased intensity of CVR among hyperreactors produces greater cumulative damage to their cardiovascular systems, placing them at greater risk for CHD. However, CVR test-retest reliability and

generalizability across stressors is only moderate (for a review, see Manuck, Kasprovicz, Monroe, Larkin, & Kaplan, 1989), suggesting that situational factors may play an important role in CVR. An alternative conceptualization of CVR is that an individual cannot be characterized as a hyperreactor without first specifying the situation and her or his appraisal of it. In this view subject characteristics interact with situational factors in producing CVR (Houston, 1986). For instance, in his review of CVR differences between Type A and B individuals, Houston (1983) concluded that Type A's are not more reactive than Type B's to all stressors, but are more reactive to Type A relevant stressors. Similarly, the present results suggest that men are only more reactive than women to masculine-relevant stressors. Moreover, women are more reactive than men to stressors particularly relevant to women.

In addition to a new conceptualization of the processes underlying sex differences in CVR, the cognitive appraisal explanation demands a new understanding of how these differences are related to the high rate of CHD among men relative to women. The present results suggest neither men nor women are more reactive to stressors. One must specify the type of stressor before stating whether men or women are more reactive. If sex differences in CVR play a role in sex differences CHD, then we should look at

differences in the frequency with which men and women face gender relevant stressors. This is consistent with Matthews' (1989) review of sex differences in CHD which suggests that the frequency of CVR experienced by men and women should be considered. Although men may not always show greater CVR than women, more frequent CVR among men than among women might produce greater atherosclerosis and increased CHD among men.

Perhaps because men and women appraise events differently, they disproportionately face masculine-relevant and feminine-relevant stressors, respectively. Due to male role socialization men might face or seek out more stressors, or appraise more events to be stressful, than do women. This hypothesis is consistent with Goldberg's (1987) contention that the male role is more stressful than the female role due to its more restrictive nature and greater emphasis on achievement. The highly restrictive nature of the male role may produce appraisal tendencies in men that render many apparently neutral situations to be highly stressful because they require nonmasculine behavior. Similarly, other seemingly neutral events may become stressful to men because they are perceived as masculine achievement challenges. In any case, a cognitive appraisal conceptualization of sex differences in CVR poses new questions for researchers regarding the frequency of

stressors and CVR in the day-to-day lives of men and women as well as the relationship of these differences to the incidence of CHD.

References

- Clarkson, T.B., Manuck, S.B., & Kaplan, J.R. (1986). Potential role of cardiovascular reactivity in atherogenesis. In K.A. Matthews, S.M. Weiss, T. Detre, T.M. Dembroski, B. Falkner, S.B. Manuck, & R.B. Williams, Jr. (Eds.), Handbook of stress, reactivity, and cardiovascular disease (pp. 35-48). New York: John Wiley & Sons.
- Eisler, R.M., & Skidmore, J.R. (1987). Masculine gender role stress: Scale development and component factors in the appraisal of stressful situations. Behavior Modification, 11, 123-136.
- Folkman, S., & Lazarus, R.S., (1985). If it changes it must be a process: Study of emotion and coping during three stages of a college examination. Journal of Personality and Social Psychology, 48, 150-170.
- Frankenhaeuser, M. (1983). The sympathetic-adrenal and pituitary-adrenal response to challenge: Comparison between the sexes. In T.M. Dembroski, T.H. Schmidt, & G. Blumchen (Eds.), Biobehavioral bases of coronary heart disease (pp. 99-105). New York: Karger.
- Gillespie, B.L. & Eisler, R.M. (in press). Development of the Feminine Gender Role Stress scale: A cognitive-behavioral measure of stress appraisal and coping for women. Behavior Modification.
- Girdler, S.S., Turner, R., Sherwood, A., & Light, K.C. (1990). Gender differences in blood pressure control during a variety of behavioral stressors. Psychosomatic Medicine, 52, 571-591.
- Goldberg, H. (1987). The hazards of being male: Surviving the myth of masculine privilege (2nd ed.). New York: Signet.
- Holmes, D.S., Solomon, S., & Rump, B.S. (1982). Cardiac and subjective response to cognitive challenge and to controlled physical exercise by male and female coronary prone (Type A) and non-coronary prone persons. Journal of Psychosomatic Research, 26, 309-316.
- Houston, B.K. (1983). Psychophysiological responsivity and the Type A Behavior Pattern. Journal of Research in Personality, 17, 22-39.
- Houston, B.K. (1986). Psychological variables and cardiovascular and neuroendocrine reactivity. In K.A. Matthews, S.M. Weiss, T. Detre, T.M. Dembroski, B. Falkner, S.B. Manuck, & R.B. Williams, Jr. (Eds.), Handbook of stress, reactivity, and cardiovascular disease (pp. 207-229). New York: John Wiley & Sons.
- Industrial and Biomedical Sensors Corporation. (1987). Operating and maintenance manual for model SD-700A automated blood pressure monitor. Waltham, MA: Industrial and Biomedical Sensors Corporation.

- Jorgensen, R.S., & Houston, B.K. (1981). Type A behavior pattern, sex differences, and cardiovascular response to and recovery from stress. Motivation and Emotion, 5, 201-214.
- Keys, A., Taylor, H.L., Blackburn, H., Brozek, J., Anderson, J.T., & Simonson, E. (1971). Mortality and coronary heart disease among men studied for 23 years. Archives of Internal Medicine, 128, 201-214.
- Krantz, D.S., Glass, D.C., Schaeffer, M.A., & Davia, J.E. (1982). Behavior patterns and coronary disease: A critical evaluation. In J.T. Cacioppo, & R.E. Petty (Eds.), Perspectives in cardiovascular psychophysiology (pp. 315-346). New York: Guilford Press.
- Krantz, D.S., & Manuck, S.B. (1984). Acute psychophysiological reactivity and risk of cardiovascular disease: A review and methodologic critique. Psychological Bulletin, 96, 435-464.
- Lash, S.J., Eisler, R.M., & Schulman, R.S. (1990). Cardiovascular reactivity to stress in men: Effects of masculine gender role stress appraisal and masculine performance challenge. Behavior Modification, 14, 3-20.
- Lawler, K.A., Allen, M.T., Critcher, E.C., & Standard, B.A. (1981). The relationship of physiological responses to the coronary-prone behavior pattern in children. Journal of Behavioral Medicine, 4, 203-216.
- Lazarus, R.S., & Folkman, S. (1984). Stress, appraisal, and coping. New York: Springer Publishing Company.
- Lundberg, U., de Chateau, P., Winberg, J., & Frankenhaeuser, M. (1981). Catecholamine and cortisol excretion patterns in three-year-old children and their parents. Journal of Human Stress, 7, 3-11.
- Manuck, S.B., Kaplan, J.R., & Clarkson, T.B. (1983). Behaviorally-induced heart rate reactivity and atherosclerosis in cynomolgus monkeys. Psychosomatic Medicine, 45, 95-108.
- Manuck, S.B., Kaplan, J.R., & Clarkson, T.B. (1985). Stress-induced heart rate reactivity and atherosclerosis in female macaques. Psychosomatic Medicine, 47, 90.
- Manuck, S.B., Kasprovicz, A.L., Monroe, S.M., Larkin, K.T., & Kaplan, J.R. (1989). In N. Schneiderman, S.M. Weiss, & P.G. Kaufmann (Eds.), Handbook of research methods in cardiovascular behavioral medicine (pp. 365-382). New York: Plenum.

- Manuck, S.B., & Krantz, D.S. (1986). Psychophysiological reactivity in coronary heart disease and essential hypertension. In K.A. Matthews, S.M. Weiss, T. Detre, T.M. Dembroski, B. Falkner, S.B. Manuck, & R.B. Williams, Jr. (Eds.), Handbook of stress, reactivity, and cardiovascular disease (pp. 11-34). New York: Wiley.
- Matthews, K.A., (1986). Summary, conclusions, and implications. In K.A. Matthews, S.M. Weiss, T. Detre, T.M. Dembroski, B. Falkner, S.B. Manuck, & R.B. Williams, Jr. (Eds.), Handbook of stress reactivity, and cardiovascular disease (pp. 461-473). New York: John Wiley & Sons.
- Matthews, K.A. (1989). Interactive effects of behavior and reproductive hormones on sex differences in risk for coronary heart disease. Health Psychology, 8, 373-387.
- Matthews, K.A., Davis, M.C., Stoney, C.M., Owens, J.F., & Caggiula, A.R. (1991). Does the gender relevance of the stressor influence sex differences in psychophysiological responses? Health Psychology, 10, 112-120.
- Matthews, K.A., & Stoney, C.M. (1988). Influences of sex and age on cardiovascular responses during stress. Psychosomatic Medicine, 50, 46-56.
- Matthews, K.A., Weiss, S.M., Detre, T., Dembroski, T.M., Falkner, B., Manuck, S.B., & Williams, R.B., Jr. (1986). Handbook of stress, reactivity, and cardiovascular disease. New York: John Wiley & Sons.
- Menkes, M. S., Matthews, K. A., Krantz, D. S., Lundberg, U., Mead, L. A., Qaqish, B., Liang, K. Y., Thomas, C. B., & Pearson, T. A. (1989). Cardiovascular reactivity to the cold-pressor test as a predictor of hypertension. Hypertension, 14, 524-530.
- Obrist, P.A., (1981). Cardiovascular psychophysiology: A perspective. New York: Plenum.
- Polefrone, J.M., & Manuck, S.B. (1987). Gender differences in cardiovascular and neuroendocrine response to stressors. In R.C. Barnett, L. Biener, & G.K. Baruch (Eds.), Gender and stress (pp. 13-38). New York: Free Press.
- Saab, P.G. (1989). Cardiovascular and neuroendocrine response to challenge in males and females. In N. Schneiderman, S.M. Weiss, & P.G. Kaufmann (Eds.), Handbook of research methods in cardiovascular behavioral medicine (pp. 453-481). New York: Plenum.

- Schneiderman, N. (1983). Behavior, autonomic function and animal models of cardiovascular pathology. In T.M. Dembroski, T.H. Schmidt, & G. Blumchen (Eds.), Biobehavioral bases of coronary heart disease (pp. 304-364). New York: Karger.
- Stoney, C.M., Davis, M.C., & Matthews, K.A. (1987). Sex differences in physiological responses to stress and in coronary heart disease: A causal link? Psychophysiology, 24, 127-131.
- Stoney, C.M., Matthews, K.A., McDonald, R.H., & Johnson, C.A. (1988). Sex differences in lipid, lipoprotein, cardiovascular and neuroendocrine responses to acute stress. Psychophysiology, 25, 645-656.
- Strube, M.J. (1989). Assessing subjects' construal of the laboratory situation. In N. Schneiderman, S.M. Weiss, & P.G. Kaufmann (Eds.), Handbook of research methods in cardiovascular behavioral medicine (pp. 527-542). New York: Plenum.
- Truett, J., Cornfield, J., & Kannel, W. (1967). Multivariate analysis of the risk of coronary disease in Framingham. Journal of Chronic Disease, 20, 511-524.
- Van Egeren, L.F. (1979). Cardiovascular changes during social competition in a mixed motive game. Journal of Personality and Social Psychology, 37, 858-864.
- Wingard, D.L., Suarez, L., & Barret-Connor, E. (1983). The sex differential in mortality from all causes and ischemic heart disease. American Journal of Epidemiology, 117, 165-172.

Appendixes

Appendix A: Informed Consent Form - Study 1

Physiological Responses Informed Consent Form:

The purpose of this study is to examine how different individuals respond physiologically to a cold stimulus. Students participating in a one-half hour session, a 45 minute session, and a 10-minute session in this experiment will receive three extra credit points (one for the half hour session, one for the 45 minute session, and one for the 10 minute session) toward your point total in Introductory Psychology (Psyc 2000).

The first session of the experiment will involve completing two questionnaires. On one you will be asked to rate how stressful different events would be if they occurred to you. On the other you will be asked to report whether you have certain health problems and to describe any past hospitalizations or current medical problems. During the second session, the procedure will be explained to all participants. Then each participant will have his or her blood pressure and heart rate monitored during relaxation and a cold-pressor task. Afterwards subjects will be asked to fill out a short questionnaire. During the third session, each participant will have his or her blood pressure and heart rate monitored during relaxation only. Subjects who do not intend to participate in this second session should not sign-up for this experiment. This experiment does not involve risk of any kind, however, the cold-pressor requires immersion of one hand in cold water which might be considered somewhat uncomfortable by some individuals. Participants have the right to withdraw their hand from the water at any time without penalty.

All information is confidential and will be seen only by the experimenters. Individual subjects will not be identified by name or any other identifier in any presentation of the results of this study. Subjects' name and student number are required to ensure extra credit; but afterwards they are deleted. Participation is voluntary and subjects may discontinue the experiment at any time without penalty. However, extra credit can only be given to students who complete the experiment.

This research project has been approved by the Human Subjects Research Committee and the Institutional Review Board. Questions about this study should be directed to:
Steven J. Lash - - - - - 552-0719
(Graduate Research Assistant)
Richard M. Eisler, Ph.D. - - - - - 961-7001
(Advisor and Principle Investigator)
Helen Crawford, Ph.D. - - - - - 961-6520
(Chair, Human Subjects Research Committee)

Dr. E. R. Stout - - - - - 231-0436
(Chairperson, Institutional Review Board)

I hereby agree to voluntarily participate in the
research project described above.

Signed: _____ . Student ID #: _____ .

Appendix B: Informed Consent Form - Study 2 Mass Testing

Individual Characteristics Questionnaires

Informed Consent Form:

The purpose of this study is to examine the relationship between participants' scores on several questionnaires. For participating in a 50 minute session you will receive one extra credit point toward your point total in Introductory Psychology (Psyc 2004). Only students in Introductory Psychology can participate. The experiment will involve completing four questionnaires. On one you will be asked to rate how stressful different events would be if they occurred to you. On another you will indicate the amount of support you receive from people in your environment. A third will ask you to report whether you have certain health problems and to describe any past hospitalizations or current medical problems. On a fourth you will indicate whether statements about personality characteristics do or do not apply to you.

This experiment does not involve any risk. All information is confidential and will be seen only by the experimenters. Individual participants will not be identified by name or any other identifier in any presentation of the results of this study. Participants' name and student number are required to ensure extra credit, but are deleted afterwards. Participation is voluntary and participants may discontinue the experiment at any time without penalty. However, extra credit can only be given to those students who complete the experiment. This research project has been approved by the Human Subjects Research Committee and the Institutional Review Board. Questions about this study should be directed to:

- Steven J. Lash - - - - - 552-0719
(Graduate Research Assistant)
- Richard M. Eisler, Ph.D. - - - - - 961-7001
(Advisor and Principle Investigator)
- Helen Crawford, Ph.D. - - - - - 961-6520
(Chair, Human Subjects Research Committee)
- Dr. E. R. Stout - - - - - 231-0436
(Chairperson, Institutional Review Board)

I hereby agree to voluntarily participate in the research project described above.

Signed: _____ . Student ID #: _____ .

Appendix C: Informed Consent Form - Study 2 CPT Session

Cold-Pressor Study Informed Consent Form:

The purpose of this study is to examine how different individuals respond physiologically to the cold-pressor. For participating in a 45 minute session and a 20 minute session individuals will receive two extra credit points toward their point total in Introductory Psychology (Psyc 2004). One extra credit point will be received after completing the first session and a second point will be received after completing the second session. Only students in Introductory Psychology can participate. During the first session each participant will have his or her blood pressure monitored during relaxation and the cold-pressor (placing a hand in cold water). Also participants will be asked to fill out a short questionnaire about the cold-pressor. For the second session participants will have their blood pressure monitored while they sit in a comfortable chair for a short time period (5-10 minutes). This experiment does not involve any risk, however, immersion of one hand in cold water is considered uncomfortable by some individuals. Participants have the right to withdraw their hand from the water at anytime without penalty. All information is confidential and will be seen only by the experimenters. Individual participants will not be identified by name or any other identifier in any presentation of the results of this study.

Participants' name and student number are required to ensure extra credit, but are deleted afterwards. Participation is voluntary and participants may discontinue the experiment at any time without penalty. This research project has been approved by the Human Subjects Research Committee and the Institutional Review Board. Questions should be directed to:

- Steven J. Lash - - - - - 552-0719
(Graduate Research Assistant)
- Richard M. Eisler, Ph.D. - - - - - 961-7001
(Advisor and Principle Investigator)
- Helen Crawford, Ph.D. - - - - - 961-6520
(Chair, Human Subjects Research Committee)
- Dr. E. R. Stout - - - - - 231-0436
(Chairperson, Institutional Review Board)

I hereby agree to voluntarily participate in the research project described above.

Signed: _____ . Student ID #: _____ .

Appendix D: Experimental Experiences Questionnaire -
Study 1

Experimental Experiences Questionnaire

Fill in the number 0000 & then the last 5 digits of your SSN on the attached opscan under ID number. DO NOT put your name on the opscan or write on this sheet.

Next, we would like you to rate your cold-pressor experience. Please use the below 7 point scales to rate your experience. Fill in the number that describes your response on the attached opscan. Do not dwell on any single item & do not write on this sheet.

USE THE FOLLOWING SCALE FOR ITEMS 1 THROUGH 7:

0 ----- 1 ----- 2 ----- 3 ----- 4 ----- 5 ----- 6
Very Little Very Much

1. How painful was this task?
2. How uncomfortable were you?
3. How well did you cope with this task?
4. How important was it that you do well?
5. How physically stressed were you?
6. How challenged or motivated were you to perform well?

USE THE FOLLOWING SCALE FOR ITEMS 8 THROUGH 9.

0 ----- 1 ----- 2 ----- 3 ----- 4 ----- 5 ----- 6
Very Poorly Very Well

7. How well will men do on this task?
8. How well will women do on this task?

Appendix E: Data Sheet - Study 1

Experimenter _____ Time _____ Date _____ Room Temp _____
 Water Temp Start _____ End water temp _____.
 Instructions: MC _____ NC _____ Experimenter Sex: M F Sex: M F
 Last 5 digits SSN _____ Wt _____ Ht _____' _____"
 Alcohol today? Y N _____ Tobacco today? Y N _____
 Caffeine today? Y N _____
 Arm Circumference _____ cm Cuff size: Large Adult Child

Baseline									
	SBP	DBP	HR	Time		SBP	DBP	HR	Time
1					10				
2					11				
3					12				
4					13				
5					14				
6					15				
7					16				
8					17				
9					18				
Anticipation									
1					2				
Cold-Pressor									
1									
Time in water _____ All? Y N									
Time reading #1: _____ secs.									
Recovery									
1					3				
2					4				

Comments & Your observations:

Appendix F: Experimental Experiences Questionnaire -
Study 2

Experimental Experiences Questionnaire

Fill in the number 0000 & then the last 5 digits of your SSN on the attached opscan under ID number. DO NOT put your name on the opscan or write on this sheet.

Next, we would like you to rate your interview experience. Please use the below 7 point scales to rate your experience. Fill in the number that describes your response on the attached opscan. Do not dwell on any single item & do not write on this sheet.

USE THE FOLLOWING SCALE FOR ITEMS 1 THROUGH 7:

0 ----- 1 ----- 2 ----- 3 ----- 4 ----- 5 ----- 6
Very Little Very Much

1. How challenged or motivated were you to perform well?
2. How threatened were you by this interview?
3. How important was it that you do well?
4. How stressed were you?
5. How relaxed were you?
6. How comfortable were you?
7. How much effort did you put into performing well?

Below, please select the number that represents how you were feeling during the interview. Do not dwell on any single item.

USE THE FOLLOWING SCALE FOR ITEMS 8 THROUGH 22:

0 ----- 1 ----- 2 ----- 3 ----- 4 ----- 5 ----- 6
Not at All Somewhat Extremely

- | | |
|------------------|---------------|
| 8. Hopeful | 16. Pleased |
| 9. Angry | 17. Anxious |
| 10. Sad | 18. Happy |
| 11. Confident | 19. Guilty |
| 12. Exhilarated | 20. Relieved |
| 13. Fearful | 21. Disgusted |
| 14. Disappointed | 22. Worried |
| 15. Eager | |

USE THE FOLLOWING SCALE FOR ITEMS 8 THROUGH 9.

0 ----- 1 ----- 2 ----- 3 ----- 4 ----- 5 ----- 6
Very Poorly Very Well

23. How well will men do on this task?
24. How well will women do on this task?

Appendix G: Data Sheet - Study 2

Experimenter _____ Time _____ Date _____ Room Temp _____
 Water Temp Start _____ End water temp _____.
 Instructions: MC _____ FC _____ Tape Voice: M F Sex: M F
 Last 5 digits SSN _____ Wt _____ Ht _____'_____"
 Alcohol today? Y N _____ Tobacco today? Y N _____
 Caffeine today? Y N _____ Exercise today? Y N _____
 Arm Circumference _____ cm Cuff size: Large Adult Child _____

Baseline									
	SBP	DBP	HR	Time		SBP	DBP	HR	Time
1					9				
2					10				
3					11				
4					12				
5					13				
6					14				
7					15				
8					16				
Anticipation									
1					2				
3									
Cold-Pressor									
1					2				
Time in water _____ All? Y N									
Time reading #1: _____ secs. Time reading #2: _____ secs.									
Recovery									
1					2				

Comments & Your observations:

Appendix H: Data Sheet for Baseline Assessment

BASELINE

Experimenter _____ Time _____ Date _____ Room Temp _____

Experimenter Sex: M F

Last 5 digits SSN _____

Alcohol today? Y N _____ Tobacco today? Y N _____

Caffeine today? Y N _____ Exercise today? Y N _____

Arm Circumference _____ cm Cuff size: Large Adult Child

	SBP	DBP	HR	Time		SBP	DBP	HR	Time
1					10				
2					11				
3					12				
4					13				
5					14				
6					15				
7					16				
8					17				
9					18				

Comments & Your observations:

CURRICULUM VITA: Steven Joseph Patrick Lash

PERSONAL INFORMATION

Born: December 20, 1963
Birthplace: Springfield, Virginia
Married: December 20, 1986

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EDUCATION

Ph.D. - Clinical Psychology.
Specialization in Health Psychology.
Virginia Polytechnic Institute & State University.
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Degree expected May, 1992
GPA: 3.9

M.S. - Clinical Psychology.
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M.S. awarded December, 1989
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B.S. - Psychology & Studio Art.
University of Richmond.
Richmond, Virginia.
B.S. awarded May, 1986
GPA: 3.9

PROFESSIONAL AFFILIATIONS

American Psychological Association, Division 12, Student Affiliate.

Association for the Advancement of Behavior Therapy, Student Affiliate.

Society for Behavioral Medicine, Student Affiliate.

ACADEMIC HONORS

Virginia Polytechnic Institute & State University:

Presidential Fellowship, 1987-1988.

Travel Grant, Graduate Student Assembly, 1989-90.

University of Richmond:

University Scholars Program (Four year academic scholarship). Graduated Summa Cum Laude with Honors in Psychology. Member of Phi Beta Kappa, Phi Eta Sigma, and Psi Chi. Undergraduate Research Award for Outstanding Researcher, Department of Psychology, 1985-86.

WORK EXPERIENCE

July, 1989-

August 1989

July, 1990-

August, 1990

Academic Advisor. Virginia Polytechnic Institute & State University, Blacksburg, Virginia.

Duties: Orientation meetings and individual advising of Liberal Arts and Sciences majors and their parents.

August, 1988-

May 1990

Director of Undergraduate Advising Center. Department of Psychology, Virginia Polytechnic Institute & State University, Blacksburg, Virginia.

Duties: Coordination of academic advising for undergraduate psychology majors. Individual academic and career advising.

June, 1988-

August, 1988

Psychiatric Aide. St. Alban's Psychiatric Hospital, Radford, Virginia.

Duties: Supervision and care of psychiatric inpatients.

- January 1987-
September 1987 Child Care Counselor. St. Joseph's Villa,
Richmond, Virginia.
Duties: Supervision and counseling of
emotionally disturbed adolescents in a
behavioral cottage program.
- April, 1986-
January, 1987 Learning Center Supervisor. Bon Air
Learning Center of the Virginia Department
of Corrections, Bon Air, Virginia.
Duties: Supervision of emotionally
disturbed, delinquent adolescents in a
behavioral cottage program.

TEACHING EXPERIENCE

- Fall 1990 &
Spring 1991 Principles of Psychological Research.
Course Instructor. Department of
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CLINICAL PRACTICA (2088 Hours).

- Summer 1990 Consult/Liason Psychology Practicum.
Supervisors: Joseph Neumann, Ph.D.
Christine Adler, Ph.D.
Psychology Service, Mountain Home Veterans
Affairs Medical Center, Mountain Home,
Tennessee.
Responsibilities: Assessment and treatment of
inpatient and outpatients. Assessment and
therapy on medical units. Experience included
work with oncology, cardiac, and pulmonary
units as well as biofeedback and smoking
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- 1990-1991 Clinical Psychology Practicum: Consultation &
Community Psychology.
Supervisor: Richard M. Eisler, Ph.D.
Psychological Services Center, Department of
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Responsibilities: Development and
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- Summer 1990 Clinical Psychology Practicum.
 Supervisors: Richard M. Eisler, Ph.D.
 Jack Finney, Ph.D.
 Psychological Services Center, Department of
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 children. Treatment of depression, chronic
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- 1989-1990 Clinical Psychology Practicum: Cardiac &
 Pulmonary Rehabilitation.
 Supervisors: Douglas R. Southard, Ph.D., M.P.H.
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 Exercise Physiology & Cardiac Rehabilitation
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 Cardio-pulmonary Rehabilitation Program,
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Responsibilities: Outpatient and inpatient
 assessment and psychotherapy with cardiac and
 pulmonary patients. Psychological evaluations
 and reports on over 30 patients. Conduction of
 biweekly relaxation group sessions.
 Consultation with medical and program staff.
 Treatment of depression, anxiety, chronic pain,
 and hypertension. Promotion of exercise,
 dietary change, and smoking cessation (480
 hours).
- 1988-1989 Clinical Psychology Practicum.
 Supervisors: Thomas H. Ollendick, Ph.D.
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1987-1988 Clinical Psychology Practicum.
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Responsibilities: Outpatient assessment and
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COMMUNITY WORKSHOPS

February, 1990 Relaxation and Breathing Techniques.
 Pulmonary Rehabilitation Program, Montgomery
 Regional Hospital, Blacksburg, Virginia.

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 Town of Blacksburg, Blacksburg, Virginia.

PUBLICATIONS

Lash, S. J., Gillespie, B. L., Eisler, R. M., & Southard, D. S. (1991). Sex differences in cardiovascular reactivity: Effects of the gender relevance of the stressor. Health Psychology, 10, 392-398.

Lash, S. J., Eisler, R. M., Schulman, R. S. (1990). Cardiovascular reactivity to stress in men: Effects of masculine gender role stress appraisal and masculine performance challenge. Behavior Modification, 14, 3-20.

Lash, S. J., & Polyson, J. A. (1988). Reassessment of gender perception in projected animal content. Perceptual and Motor Skills, 67, 547-553.

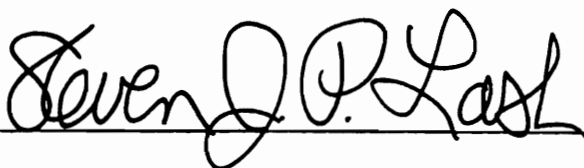
Lash, S. J., & Polyson, J. A. (1987). The gender relevance of projected animal content. Journal of Clinical Psychology, 43, 145-150.

Polyson, J. A., Lash, S. J., Evans, K. (1986). Human sexuality courses: Where and how many? Teaching of Psychology, 13, 221-222.

PRESENTATIONS

- Lash, S. J., & Skidmore, J. R. (November, 1990). The relationship between gender role stress appraisal and cardiovascular reactivity. Paper presented at the 24th Annual Convention of the Association for the Advancement of Behavior Therapy, San Francisco, California.
- Lash, S. J., Eisler, R. M., & Southard, D. R. (1990, April). Coping with the cold-pressor test as a function of high and low challenge. Poster presented at the 11th Annual meeting of the Society of Behavioral Medicine, Chicago, Illinois.
- Lash, S. J., Southard, D. R., & Berglund, C. (1990, April). Coping with the cold-pressor test: Effects on cardiovascular reactivity. Poster presented at the 11th Annual meeting of the Society of Behavioral Medicine, Chicago, Illinois.
- Lash, S. J., & Eisler, R. M. (1989, November). Cardiovascular reactivity to masculine gender role stress: Effects of stress appraisal and masculine achievement challenge. Poster presented at the 23rd Annual Convention of the Association for the Advancement of Behavior Therapy, Washington, D.C.
- Lash, S. J., & Eisler, R. M. (1989, June). Cardiovascular reactivity in men: Effects of gender role stress and type of stress. Paper presented at the First Annual Interdisciplinary Men's Studies Conference, Pittsburgh, Pennsylvania.
- Lash, S. J., McDowell-Rand, C., & Franchina, J. J. (1989, March). Stress and coping with a college examination: The relationship of coping and blood pressure changes. Paper presented at the 35th Annual Meeting of the Southeastern Psychological Association, Washington, D.C.
- Lash, S. J. (1986, April). Effects of sex-typing on the perception of gender in projected animal content. Paper presented at the University of Richmond's Undergraduate Research Symposium, Richmond, Virginia.

Signature: _____


 A handwritten signature in black ink, reading "Steven J. P. Lash", written over a horizontal line. The signature is cursive and somewhat stylized.