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ABSTRACT

Although coronary prone, or Type A behavior, appears to predict coronary heart disease in women, as it does in men, little research has compared men and women in the same life circumstances. To determine if there is a coronary prone behavior pattern in women preparing for traditionally male professionals, two studies were conducted. In the first study, 168 undergraduate women, in three traditionally male fields (i.e., engineering, management, and pre-medicine), 145 udergraduate men in the same fields, and 83 undergraduate women majoring in traditionally female fields (i.e., education, sociology, and psychology) completed a questionnaire. Measures of personality characteristics, physical and psychological symptoms, and work environment strain that are related to Type A behavior were assessed. Results showed that the three groups differed significantly on Type A, as well as on other variables. The traditional women were significantly lower on Type A than the nontraditional women and the men. Very small differences were found in Type A for men and women in the same work environment. In a followup study, 216 subjects from the original sample completed similar questionnaires. Results showed that subjects whose current occupations were the same as their undergraduate majors did not differ on Type A. As in the first study, traditional women were significantly less Type A then the nontraditional women or men. The work environment was especially relevant to Type A, and Type A was especially relevant to symptoms for women and, to a lesser extent, for men who were currently in high status, traditionally male fields. Type A was a better predictor of symptoms for women working in high status, traditionally male roles than it was across all subjects. (KGB)

CORONARY PRONE BEHAVIOR PATTERN IN WOMEN PREPARING FOR TRADITIONALLY MALE PROFESSIONS

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Paper presented at the Annual Meeting of the Eastern Psychological Association, Boston, MA, March 21-24, 1985.

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Introduction

Most research on the Coronary Prone Behavior Pattern, or Type A, has been conducted on white collar, middle-aged men. Although Type A appears to predict coronary heart disease in women, as it does in men (Haynes & Feinleib, 1980), little research has investigated other correlates of Type A in women (Haw, 1982). Even those studies that assess gender differences in Type A rarely compare men and women who are in the same life circumstances. This is an important omission because the most popular model of the causes of Type A behavior (Friedman & Rosenman, 1974) specifies two necessary causes, a predisposing personality and an appropriate eliciting environment (see Figure 1). Differences in Type A scores found between working men and housewives obviously could be due either to the environment or personality differences. Less obviously, the same is true of comparisons of male and female professionals because the male samples typically include high status, traditionally male professions (e.g., physicians, lawyers) whereas the female samples typically include lower status, traditionally female professions (e.g., nurses, teachers).

We tested undergraduate students who were still in the same general work environment. To determine gender differences with work environment controlled, we compared women preparing for traditionally male professions to men studying in the same fields. To control for gender and determine the effect of work environment for these nontraditional women, we compared them to women preparing for traditionally female professions.

UNDERGRADUATE STUDY

Method

Subjects. A questionnaire was mailed to Bucknell University juniors and seniors in the spring of 1981. The total population of 286 women in three traditionally male fields (engineering, management, and pre-medicine) and a matched group of 286 men in the same fields were included in the sample. In addition, the questionnaire was mailed to the 161 women who were majoring in education, sociology, and psychology; these fields were considered traditionally female because 80-95% of those in the major were women and a high proportion planned to enter traditionally female professions. Subjects received a small incentive for completing the questionnaire. After a second mailing, return rates were at least 60% for all three groups. Subjects whose employment plans were inconsistent with their major in terms of traditionality (e.g., education majors planning to attend law school) were excluded from the analyses. The final samples were 168 nontraditional women, 145 men, and 83 traditional women.

Questionnaire. The questionnaire contained measures of perceptions of the work environment (i.e., college studies) based on those used by Caplan et al. (1975) in their study of 23 occupations. These variables included three measures of quantitative workload (long, short, and combined scales), qualitative workload, workload dissatisfaction, variance in the workload, role ambiguity, and utilization of abilities. A more general measure of job-related tension also was included (Indik, Seashore, & Slesinger, 1964).

Personality variables possibly related to Type A also were assessed. These were job involvement (Lodahl & Kejner, 1965); masculinity and femininity (Spence, Helreich, & Stapp, 1979); and four aspects of achievement motivation-- mastery, work orientation, personal unconcern, and competitiveness (Helmreich & Spence, 1978).

Because our sample was unlikely to contain many cases of full-blown coronary heart disease, four measures of physical and psychological symptoms that could be outcomes of Type A behavior were included. A modified version of the Seriousness of Illness Rating

Scale (Masuda, Wyler, & Holmes, 1970) was scored separately for physical and psychological illnesses. Milder symptoms were assessed with a modification of the psychosomatic symptom measure developed by Indik et al. (1964) and a measure of anxiety, depression, and irritation from Caplan et al. (1975). A measure of strain in the form of job pressures, perceptions of subjective stress related to work, also was included (Buck, 1972).

Finally, Type A was assessed with a short objective scale, the Framingham Type A Scale (Haynes et al., 1978). The FTAS is the only Type A scale to have been validated for women as well as for men in a prospective study.

Results

To decrease missing data, most of the scales were scored as the mean of the items completed, as long as at least half of the items were answered. For example, Type A was scored by dividing the individual's total score by the items answered; this procedure yielded possible scores from 1 to 4, with 1 reflecting the most coronary prone behavior. As shown in Table 1, the three groups differed significantly on Type A, as well as on other variables. Tukey HSD tests showed the traditional women to be significanty lower on Type A than the nontraditional women and the men. Although their average scores were very similar, the men were reliably more Type A than the nontraditional women due to the large sample size.

Table 2 shows the three groups' correlations of Type A with possible predittors (perceptions of the work environment and personality measures) and possible outcomes. Type A was related to perceptions of the work environment, most strongly for nontraditional women followed by men in the same fields. The measures relating to workload and overall job tension show the strongest relationships with Type A. Among the personality measures, competitiveness and job involvement yielded the strongest relationships with Type A for all three groups; otherwise, the three groups yielded different patterns, with the men showing the weakest relationships. Type A predicted symptoms and strain best for the nontraditional women, reliably predicting all five measures for this group and for the men; only two mild, non-physical measures were predicted for the traditional women.

Discussion

Previously reported "gender differences" in Type A scores may be due to factors related to environmental circumstances rather than gender per se; we found very small differences in Type A for men and women in the same work environment. In fact, Type A seems to be an especially relevant concept for women preparing for traditionally male professions; Type A was more strongly related to perceptions of the work environment for this group than for the other two groups and was more strongly related to well-being for these nontraditional women also.

Obviously, the direction of causality cannot be determined unequivocably from this study in which Type A and its possible precursors and outcomes were determined simultaneously. For that reason, the same subjects recently received a follow-up questionnaire.

ALUMNI STUDY

Method

Subjects. After two mailings in late 1983 and early 1984, 216 of the original subjects returned a similar questionnaire. In order to ascertain agreement with undergraduate major, subjects' current work was categorized as either high status, traditionally male or low status, traditionally female. Only 5 males had moved from engineering, management, or pre-medicine college programs into lower status work as alumni; their data are included in the overall analyses but are not presented separately.

Questionnaire. Measures of personal characteristics, symptoms, and strain were the same as in the undergraduate questionniare. Job involvement and two of the undergraduate work scales were omitted, and two other work scales from the Caplan et al. (1975) study

were added. Wording of the work scales was changed where necessary to improve appropriateness across diverse types of work; some items were omitted for the same reason or to improve reliability.

Results and Discussion

Except for physical and psychological illnesses, scales were scored as the mean of the items answered by an individual (as long as at least half of the items were answered). Table 3 shows that the three groups of subjects whose occupations were consistent with their undergraduate majors did not differ on Type A. These subjects' undergraduate Type A scores were representative of their undergraduate groups; on undergraduate scores, the traditional women participating in the alumni study were significantly less Type A than the nontraditional women or men participating in the alumni study. As alumni, the three groups did differ significantly on other measures including several of the work scales. Possibly related to the Type A means is the fact that traditional women here reported the most stressful work environments, whereas they reported the least stressful work environments as undergraduates.

Table 4 shows that, over all subjects, current work environment was related to alumni Type A scores, but undergraduate work environment was not. Both alumni and, to a lesser extent, undergraduate personality scales were related to alumni Type A; however, Type A itself does not appear to be a personality trait as undergraduate and alumni scores yielded a correlation coefficient of only .29. Only alumni Type A predicts strain and symptoms, predicting all except physical illnesses. These correlations are consistent with Friedman and Rosenman's model. Table 5 shows the correlations of other alumni variables with alumni Type A for the five groups classified on consistency or change from undergraduate to alumni work field. As in the undergraduate study, the work environment seems especially relevant to Type A and Type A especially relevant to symptoms for women and, to a lesser extent, men who are currently in high status, traditionally male fields.

A further test of Friedman and Rosenman's model, conducted over all subjects, is presented in Figure 2. Undergraduate Type A was included in the personal characteristics to insure that the "predisposing personality" was represented; the regression of alumni Type A on these variables was highly significant. Regression of alumni Type A on current work environment also was highly significant. Whichever set of predictors was included first in a hierarchical multiple regression, the other set added significantly to the proportion of variance explained ($p<.001$). Although the ability of these variables to predict Type A conforms to Friedman and Rosenman's model, alumni Type A was a disappointing predictor of alumni symptoms, performing worst for physical illnesses and coronary-related symptoms, a subset of physical illnesses. In fact, regression of the strain and symptom measures directly on undergraduate personal characteristics and current work environment accounted for more variance in Type A than the correlations of Type A with these measures. However, when added as the third step of hierarchical regressions after undergraduate personal characteristics and current work environment, alumni Type A added significantly to the prediction of psychological illnesses ($p<.05$), anxiety-depression-irritation ($p<.001$), psychosomatic illnesses ($p<.05$), and job pressures ($p<.001$). In that sense, at least, Type A was a valuable predictor across different types of subjects. And, as noted above, Type A was a better predictor of symptoms for women working in high status, traditionally male roles than it was across all subjects.

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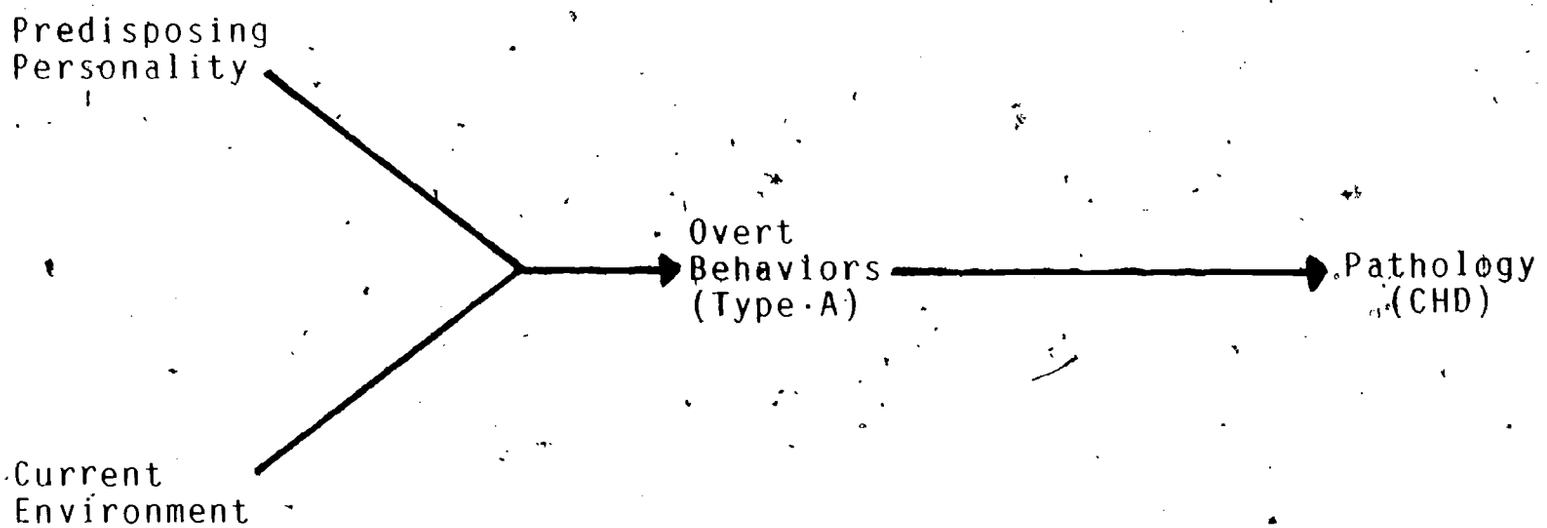
Figure 1



The most commonly accepted model of Type A behavior (Friedman & Rosenman, 1974). The predisposing personality interacts or combines with the environment to produce Type A behaviors. These behaviors then lead to pathology.

Table 1

Means and Standard Deviations (in parentheses) of Undergraduate Work Environment Scales, Personal Characteristics Scales, and Symptom Measures for Men, Non-traditional Women, and Traditional Women

Measure	F ratio for Oneway ANOVA	Scale Range	[redacted]	Non-traditional Women n=168	Traditional Women n=83
Quantity of Work (long)	7.99***	1-6		3.73^{a} (.46)	3.49^{b} (.40)
Quantity of Work (short)	7.32***	1-5	3.63^{b} (.66)	3.77^{a} (.64)	3.45^{b} (.59)
Combined scales	5.31**	1-5	$3.67^{a,b}$ (.70)	3.77^{a} (.55)	3.51^{b} (.52)
Quality of Work	5.27**	1-5	$3.60^{a,b}$ (.57)	3.68^{a} (.57)	3.43^{b} (.59)
Workload Dissatisfaction	3.20*	1-5	$2.75^{a,b}$ (.95)	2.9^{a} (.88)	2.62^{b} (.86)
Variance of Work	.46	1-4	2.64 (.59)	2.70 (.57)	2.70 (.59)
Role Ambiguity	2.36	1-5	3.67 (.65)	3.82 (.60)	3.79 (.55)
Utilization of Abilities	1.18	1-5	3.22 (.75)	3.29 (.73)	3.14 (.80)
Job Tension	3.98*	1-5	2.50^{b} (.45)	2.67^{a} (.50)	$2.63^{a,b}$ (.71)
Type A+	6.46**	1-4	2.38^{a} (.46)	2.43^{b} (.54)	2.62^{c} (.44)
Job Involvement+	.47	1-4	2.38 (.30)	2.35 (.26)	2.35 (.27)
Masculinity	14.57***	0-32	22.74^{a} (4.61)	21.37^{b} (4.14)	19.67^{c} (3.25)
Femininity	17.83***	0-32	23.12^{c}	24.50^{b}	26.47^{a}
Mastery	5.80**	0-32	20.06^{a} (3.80)	$19.40^{a,b}$ (4.00)	18.23^{b} (3.96)
Work Orientation	4.91**	0-32	20.21^{b} (2.73)	21.13^{a} (2.56)	$20.75^{a,b}$ (2.31)
Personal Unconcern	3.39*	0-16	9.51^{b} (2.57)	$10.08^{a,b}$ (2.41)	10.33^{a} (2.48)
Competitiveness	21.90***	0-20	12.84^{a} (3.31)	11.82^{b} (3.53)	9.64^{c} (3.85)
Physical Illnesses	9.67***	0-117	4.70^{b} (3.17)	6.38^{a} (3.93)	6.28^{a} (3.63)
Psychological Illnesses	7.68***	0-2 or more	$.27^{b}$ (.52)	$.49^{a}$ (.71)	$.59^{a}$ (.75)
Anxiety-Depression-Irritation	.74	1-4	1.83 (.41)	1.89 (.42)	1.86 (.39)
Psychosomatic Symptoms	20.43***	1-5	1.00^{b} (.79)	1.57^{a} (.88)	1.55^{a} (.88)
Job Pressures	14.56***	1-5	2.75^{b} (.84)	3.07^{a} (.79)	2.52^{b} (.74)

Note. Means with different superscripts are reliably different ($p < .05$) on Tukey (Honestly Significant Difference) tests.

+ The Type A and Job Involvement scales are reverse-scored so that a high score indicates less of the characteristic.

* $p < .05$, two-tailed.
** $p < .01$.
*** $p < .001$.

Table 2

Coefficients for Correlations of Undergraduate Work Scales, Personal Characteristics Scales, and Symptom Measures with Type A for Men, Non-traditional Women, and Traditional Women

Measures	Type A		
	Men n=146	Non-traditional women n=168	Traditional women n=83
Quantity of Work (long)	-.22**	-.32**	-.25*
Quantity of Work (short)	-.30**	-.31**	-.57**
Combined scales	-.17*	-.33**	-.36**
Quality of Work	-.27**	-.36**	-.14
Workload Dissatisfaction	-.22**	-.29**	-.14
Variance of Work	-.11	-.22**	-.29**
Role Ambiguity	.11	.14	.04
Utilization of Abilities	.09	.08	.15
Job Tension	-.38**	-.45**	-.35**
Masculinity	.04	-.05	-.05
Femininity	.17*	.06	.04
Job Involvement	.21**	.37**	.31**
Mastery	.07	-.22**	-.23*
Work Orientation	-.02	-.20*	-.03
Personal Unconcern	.14	.14	.45**
Competitiveness	-.37**	-.47**	-.46**
Physical Illnesses	-.17*	-.26**	.04
Psychological Illnesses	-.25**	-.20**	-.03
Anxiety-Depression-Irritation	-.33**	-.36**	-.37**
Psychosomatic Symptoms	-.18*	-.32**	.00
Job Pressures	-.43**	-.56**	-.39**

Note. The Type A and Job Involvement scales are reverse-scored.

* $p < .05$, two-tailed.
** $p < .01$.

Table 3

Means and Standard Deviations (in parenthesis) of the Alumni Work Environment Scales, Personal Characteristics Scales, and Symptom Measures for Respondents Whose Occupations were Consistent with Their Undergraduate Major

Measure	F ratio for Oneway ANOVA	Scale Range	Men n=48	Non-traditional women n=68	Traditional women n=56
Quantity of Work (long)	1.50	1-5	3.51 (.54)	3.59 (.64)	3.70 (.48)
Quantity of Work (short)	1.93	1-5	3.40[b] (.78)	3.46[a,b] (.93)	3.69[a] (.68)
Combined scales	1.94	1-5	3.46[b] (.62)	3.52[a,b] (.75)	3.70[a] (.52)
Quality of Work	.62	1-5	2.36 (.61)	2.47 (.81)	2.33 (.70)
Role Ambiguity	1.60	1-5	3.45 (.78)	3.61 (.75)	3.71 (.75)
Utilization of Abilities	2.95	1-5	3.02[b] (.94)	3.36[a,b] (.87)	3.45[a] (1.03)
Job Tension	1.01	1-5	2.37 (.40)	2.42 (.50)	2.50 (.52)
Responsibility for Others	26.65***	1-5	2.24[b] (.94)	2.33[b] (1.06)	3.67[a] (1.38)
Participation in Decisions	1.06	1-5	2.93 (1.03)	3.04 (.98)	3.21 (.96)
Type A[+]	.72	1-4	2.64 (.47)	2.72 (.44)	2.63 (.49)
Masculinity	1.85	1-5	3.71 (.48)	3.61 (.42)	3.54 (.49)
Femininity	18.50***	1-5	3.91[b] (.48)	3.95[b] (.54)	4.33[a] (.40)
Mastery	4.78**	1-5	3.75[a] (.58)	3.55[a,b] (.53)	3.43[b] (.52)
Work Orientation	3.31	1-5	4.40[a,b] (.42)	4.34[b] (.44)	4.53[a] (.36)
Personal Unconcern	2.24	1-5	3.61 (.65)	3.65 (.66)	3.86 (.68)
Competitiveness	2.01	1-5	3.49[a] (.65)	3.36[a,b] (.84)	3.18[b] (.85)
Physical Illnesses	4.47	0-35 or more	8.31[b] (8.79)	12.93[a] (13.96)	15.63[a] (13.33)
Psychological Illnesses	3.18	0-6 or more	.27[b] (.71)	.70[a,b] (2.21)	1.25[a] (2.41)
Anxiety-Depression-Irritation	.14	1-5	1.82 (.41)	1.84 (.41)	1.86 (.39)
Psychosomatic Symptoms	3.58*	0-5	.60[b] (.72)	.96[a] (.80)	.99[a] (.90)
Job Pressures	.13	1-5	2.76 (.73)	2.75 (.81)	2.82 (.79)

Note. Different superscripts indicate reliable differences ($p < .05$) between the groups on a Planned Contrast test of means.

[+] Type A is reverse-scored.

* $p \leq .05$, two-tailed.
** $p < .01$.
*** $p < .001$.

Table 4

Coefficients for Correlations of the Undergraduate and Alumni Work Scales, Personal Characteristics Scales, and Symptom Measures with Alumni Type A

	Alumni Type A	
Measures	Undergraduate measures n=216	Alumni measures n=216
Quantity of Work (long)	-.05	-.33***
Quantity of Work (short)	-.02	-.41***
Combined scales	-.03	-.40***
Quality of Work	.04	-.26***
Workload Dissatisfaction	-.03	NA
Variance in Work	-.08	NA
Role Ambiguity	-.03	.04
Utilization of Abilities	.05	-.10
Job Tension	.00	-.21***
Responsibility for Others	NA	-.13*
Participation in Decisions	NA	-.11
Type A	.29***	1.00
Masculinity	-.21***	-.35***
Femininity	-.05	.09
Job Involvement	.11	NA
Mastery	-.14*	-.26***
Work Orientation	.00	-.15*
Personal Unconcern	.13*	.10
Competitiveness	-.28***	-.40***
Physical Illnesses	-.05	-.09
Psychological Illnesses	-.01	-.22***
Anxiety-Depression-Irritation	-.08	-.32***
Psychosomatic Symptoms	-.07	-.20***
Job Pressure	-.09	-.52***

Note. The Type A and Job Involvement scales were reverse-scored. NA indicates that the scale was not used in the study..

* $p < .05$, two-tailed.
** $p < .01$.
*** $p < .001$.

Table 5

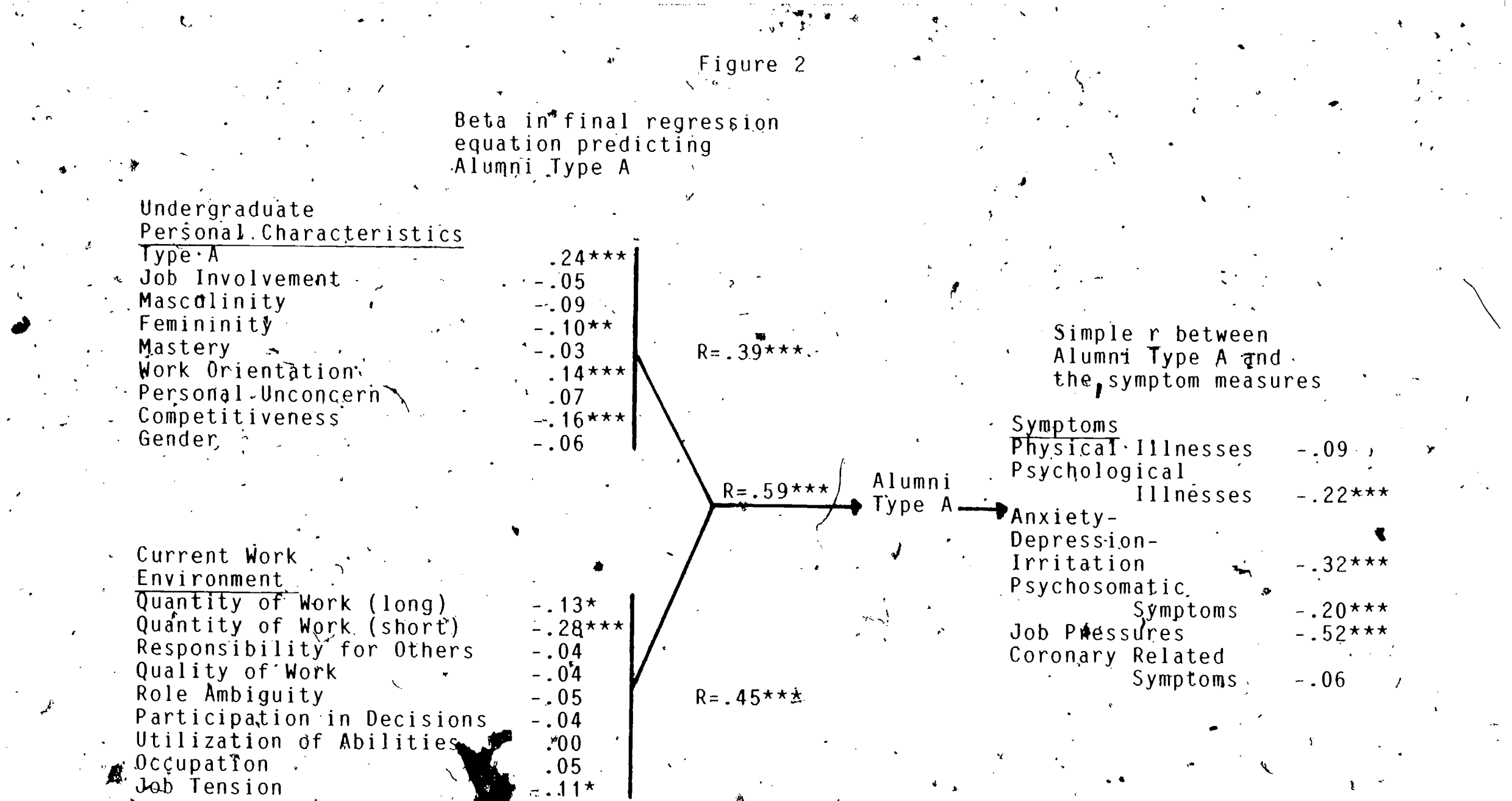
Coefficients for Correlations of the Work Scales, Personality Scales, and Symptom Measures with Type A for the Five Alumni Groups

Measure	Hi-Lo women n=22	Hi-Hi women n=69	Lo-Hi women n=13	Lo-Lo women n=56	Hi-Hi men n=48
Quantity of Work (long)	.10	-.48***	-.46	-.10	-.51***
Quantity of Work (short)	-.37	-.45***	-.64*	-.24	-.50***
Combined scales	-.23	-.48***	-.58*	-.20	-.53***
Quality of Work	-.15	-.39***	-.58*	-.17	-.17
Role Ambiguity	.18	.16	.18	.08	-.20
Utilization of Abilities	.05	-.14	-.60*	.03	-.17
Job Tension	-.04	-.42***	-.70***	-.13	-.03
Responsibility for Others	-.33	-.10	-.38	.02	-.37**
Participation in Decisions	.02	-.25*	-.10	-.07	-.16
Masculinity	-.20	-.33**	-.57*	-.25	-.55***
Femininity	-.16	.14	.40	.18	.03
Mastery	-.23	-.10	.17	-.42***	-.39**
Work Orientation	-.31	.04	.17	-.25	-.19
Personal Unconcern	-.01	.02	-.17	.26	.04
Competitiveness	-.36	-.53***	-.66*	-.43***	-.21
Physical Illnesses	-.23	-.20	-.33	.02	.07
Psychological Illnesses	-.40	-.36**	-.17	-.17	.12
Anxiety-Depression-Irritation	-.37	-.46***	-.55*	-.27*	-.21
Psychosomatic Symptoms	-.15	-.26*	-.47	-.05	-.30*
Job Pressures	-.22	-.58***	-.82***	-.54***	-.54***

Note. Type A is reverse-scored. Respondents are divided into groups on the basis of status of their Undergraduate major (presented first in title) and Alumni occupation. "Hi" indicates high status, traditionally male profession; "Lo" indicates low status or traditionally female occupation.

* $p < .05$.
** $p < .01$.
*** $p < .001$.

Figure 2



* $p < .05$
** $p < .01$
*** $p < .001$

Friedman and Rosenman's (1974) model of Type A behavior tested by regression of Alumni Type A on Undergraduate personal characteristics, Alumni work scales, and on both sets of predictors (with betas) and by simple correlations of Type A and symptom measures (n=216).