

## Type A Behavior Pattern and Coping and Defense

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The relationship of coping and defense to Type A behavior pattern (TABP), as measured by the Structured Interview and the Jenkins Activity Survey (JAS), was investigated to understand the dynamics of TABP and psychological factors associated with coronary heart disease (CHD) risk. It was hypothesized that global TABP and its component "speed and impatience" would be related to the use of defense mechanisms, while the TABP attribute "job involvement" would be related to high coping. The interview measure of global TABP was not related to coping and defense. For the JAS, "job involvement" was related to high coping scores and low defense scores, "speed and impatience" was related to high defensiveness, and "hard driving" was related to low coping scores. One implication is that TABP may be associated with increased CHD risk only when combined with low coping skills and high defenses. The JAS findings imply that increased coronary risk may be associated with poor coping skills. Future studies should examine multifactorial interaction of personality variables that may contribute to CHD risk.

### INTRODUCTION

Type A behavior pattern (TABP) has been extensively studied as a risk factor for coronary heart disease (CHD). A major prospective study established that this behavior pattern is associated with elevated CHD risk even when traditional risk factors, such as hypertension, serum cholesterol level, and cigarette smoking are controlled statistically (1). Further research is needed, however, in order to acquire a more detailed understanding of the psychosocial dynamics of TABP. Such an understanding would contribute to efforts to reduce CHD risk secondary to TABP (2). Although past research has

failed to establish strong associations between TABP and traditional personality measures (3), TABP is conceptualized as having personality components. Useful information should therefore be gained by considering selected personality attributes that may be important to TABP. This article addresses this issue along with the more general topic of personality dynamics associated with CHD risk by considering the association between TABP and coping and defense mechanisms.

A detailed understanding of the dynamics of TABP, including its relation to coping and defense, must consider individual elements of the pattern as well as the overall pattern. TABP is a clinical syndrome comprised of a group of symptoms that tend to occur in combination. Not all of these symptoms may contribute actively to the CHD risk associated with TABP. For example, the Jenkins Activity Survey (JAS) measures three distinct factors, each comprised of specific symptoms that are part of TABP (4). Research with this instrument shows that

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only one factor, "Speed and Impatience," is associated with increases in CHD risk, while another, "Job Involvement," is negatively related to risk (5-7).<sup>1</sup>

Findings such as these mean that specific TABP elements must be studied to isolate critical elements of the pattern and to understand the accompanying psychosocial dynamics of the pattern. At the same time, the reliable association of specific JAS elements and CHD risk means that studying these behaviors contributes to the general objective of understanding the psychosocial dynamics of CHD risk even though these factors are sometimes relatively independent of measures of overall TABP.

Both the full TABP and specific pattern elements can be related to styles of adjustment to stress that figure heavily in psychosomatic theories of illness (11,12). These styles are generally broadly categorized into "coping" and "defense" (13-16). While coping and defense can be distinguished in a variety of ways, two important ones are flexibility of behavior and effectiveness of management of affect. Coping is characterized by flexibility and appropriate, controlled affect; defense can

be defined by the opposite characteristics (13,14).

Prior research suggests a positive association between TABP and defensive behavior given the definitions in the previous paragraph. Glass and his colleagues have suggested that rigid, maladaptive behavior occurs when Type A's are faced with uncontrollable stress (17). In several instances, it has also been suggested that the use of defenses such as denial and repression makes it possible for Type A's to attack demanding situations (18-20). A recent laboratory study that examined the coping and defense mechanisms provides some support for this possibility (21).<sup>2</sup> In addition, the JAS factor of "Speed and Impatience," which is associated with increased CHD risk, reflects impulsiveness and poor control of one's temper (4). In combination, these prior observations suggest that Type A's are behaviorally

<sup>1</sup>This has been observed independently by Lundberg (8,9) and has been found in three separate studies (5-7). Although the findings of the individual studies are marginally significant, combined results of the studies provide convincing evidence of a negative association ( $p < 0.02$ ). The determination of the combined probability of these three independent observations was made using several tests described by Rosenthal (10). These included the method of adding probabilities, the method of adding  $Z$ s, the method of adding  $Z$ s, and the method of adding weighted  $Z$ s. The other methods mentioned have logical or practical limitations for the present study. The largest probability that the event is chance yielded by any of the tests employed. The frequently used Fisher test would provide a significance estimate of  $p < 0.05$ .

<sup>2</sup>Pittner and Houston (21) employed a study design contrasting the reactions of extreme groups of Type A's and Type B's to different types of tasks. Their measures of defenses were single-item self-report responses. A's were higher than B's on overall suppression scores ( $p < 0.088$ ) and on denial when facing threat to self-esteem ( $p < 0.061$ ). Because each finding was only marginally significant and represented only one of 16 individual significance tests, these differences have a high probability of occurring by chance alone. Applying a binomial test with the probability of "success" set at the significance levels indicated for the findings (22), the probability of at least one such main effect is 36.5%, while the probability of at least one such interaction effect is 25.9%. Particularly in view of the use of an extreme groups design, which should tend to accentuate A-B differences, these findings do not provide strong support for a hypothesis that the defense and coping measures are related to TABP. However, because the single-item-dependent measures probably had low reliability and there is other evidence showing similar trends, the results from this study can be regarded as tentatively supporting the association between defenses and TABP. It should be clear, though, that the association may not be very strong.

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rigid and have difficulty managing affect, both of which are signs of defensiveness.

The inability to manage affect may play a key part in the association between TABP and CHD. Poor management of affect implies physiological arousal such as that characterizing Type A's faced with challenging tasks (23-28). This arousal may link environmental events to physiological mechanisms that increase CHD risk (29). Although arousal may characterize Type A's only when they face some types of stress (20,30,31), if defensiveness is a factor in this arousal, it is implicated in CHD risk.

Although overall TABP may be related to defensive behavior, this association may not be true of specific pattern elements. This report considers the TABP elements of "Speed and Impatience," "Job Involvement," and "Hard-driving" that are measured by the JAS (4). As noted above, "Speed and Impatience" reflects impulsiveness and poor affect control, both of which would be expected to relate to use of defenses. "Job Involvement" reflects a tendency to plan ahead, to achieve life goals, to find work challenging, and to apparently be successful. The implied foresight, positive attitude toward potentially stressful life situations, and apparent success in life are all consistent with expectations for people who emphasize coping over defense, so "Job Involvement" should be related to coping behaviors. "Hard-driving" behavior reflects working hard and being competitive. The components of this dimension do not suggest any clear predominance of defense or coping tendencies.

In summary, research into the dynamics of TABP is needed to understand the psychosocial components of the increased CHD risk associated with this behavior pattern. This research must

attend to specific elements of the TABP as well as to the full pattern to provide a framework for integrating findings from prior research dealing with all these variables. Coping and defenses are personality attributes that may be related to TABP and its elements and that are important in general theories concerning psychosocial health risks. It is hypothesized that TABP will be associated with higher defensiveness, as will the specific element of "Speed and Impatience." "Job Involvement," however, should be related to higher levels of coping. "Hard-driving" behavior may be related to poorer coping or to higher defenses, or both, but no specific hypothesis is suggested for this element.

## METHOD

### Sample

The sample was drawn from a larger study of the heritability of risk factors for CHD conducted by the National Heart, Lung, and Blood Institute (32). The sample in that study is comprised of adult male twins. The present subsample is composed of twin sets from the three California examining centers. Only those California twins who completed the California Psychological Inventory, which contained the items required for scoring defense and coping, were used. The present sample consists of 238 fraternal twins (119 intact pairs) and 238 identical twins (119 intact pairs).

The mean age for the sample was 48 years with a range from 42 to 57 years. On the Hollingshead scale for education, the average corresponded to "some college education" (mean = 3.31, SD = 1.81) and the mean occupational level was equivalent to white collar workers/small business owners (mean = 3.57, SD = 2.49).

### Assessment of Type A Behavior Pattern

Conceptually, "the extreme Type A person (Type A1) is chronically involved in an almost never-

ending struggle to achieve poorly defined goals against all odds." These individuals are aggressive, competitive, hostile, and feel a time urgency that leads to accelerated behavior. The Type B person, at the other extreme, only shows these characteristics on rare occasions. A detailed description of the TABP is given by Rosenman (33).

The Structured Interview, which is the standard means of measuring TABP, has been described elsewhere (33). Scores are based on responses to a fixed set of questions and behaviors observed during the interview. The interview itself is structured to elicit Type A behavior. In the present study, interview ratings were made by Dr. Ray H. Rosenman, who classified the participants into the standard five categories: 1) Type B traits only, 2) primarily Type B traits with occasional Type A behaviors, 3) approximately equal Type A and Type B behaviors, 4) most, but not all, Type A characteristics, and 5) extreme Type A. This five-point classification was treated as a "continuous" variable for the correlation analyses in this study.

The JAS (34) provided questionnaire measures of TABP. "Speed and Impatience" (JAS S) reflects a tendency to hurry, to feel time pressure, and to be annoyed with anything that slows progress toward goals. "Job Involvement" (JAS J) reflects the person's reported investment in his work, i.e., the amount of time spent, concern about the job, feelings of motivation and challenge, planning the career (i.e., schooling) and success (i.e., professional progress). "Hard-driving" (JAS H) behavior involves being competitive and putting more effort, precision, seriousness, and responsibility into one's work. These three scales were developed by factor analysis of the JAS (4). A fourth scale, the "A-B" scale, was developed by selecting and weighting items in the JAS to produce optimal prediction of interview ratings (5).

#### Defense and Coping Measures

Scales developed by Joffe and Naditch (35) were used to measure coping and defense. These scales are comprised of items selected from the California Psychological Inventory (36) on the basis of their ability to predict clinical ratings of the ego mechanisms. The clinical ratings were based on a conceptual model developed by Haan (13) and Kroeber (14). This model assumes defense and coping mechanisms occur in pairs, each of which represent manifestations of a general ego function. Defense and coping are distinguished by qualitative

characteristics of the ego function. Coping involves undistorted perceptions of feelings, motives, and the environment. These perceptions provide a rational evaluation of situational requirements, which is then the basis for decisions. Resulting courses of action provide means for expressing appropriate amounts and types of affect and direct impulse satisfaction. Courses of action are changed when necessary to adapt to changes in the situation.

Defenses involve distortions of perceptions and decisions based on these distortions tend to be ineffective and irrational. Cognitive processes are illogical, employing such techniques as symbolic substitution in place of rational analysis. Resulting behavior is rigid and likely to be based on unresolved past conflicts rather than the requirements of the present situation. Affect is often inappropriate in type and/or magnitude and impulse satisfaction is achieved indirectly. Table 1 defines the general ego processes and the coping and defense mechanisms associated with each. More detailed descriptions of the conceptual model are available elsewhere (13,14,37,38)

In addition to the scales for specific coping and defense mechanisms, Joffe and Naditch (35) developed six summary scales. "Summed coping" and "Summed defense" scales were developed to predict the total coping and defense scores an individual received. Additional scales were developed to predict configurations of the defense and coping mechanisms identified by a factor analysis of the clinical ratings of defenses. "Controlled coping" reflects a tendency toward high scores on objectivity, intellectuality, and substitution and low scores on displacement, repression, and projection. "Expressive coping" is associated with high scores on regression in service of the ego and empathy and low scores on repression and reaction formation. "Structured defense" is characterized by high scores on intellectualization, rationalization, projection, and isolation. "Primitive defense" is associated with high scores on doubt and regression and low scores on concentration and sublimation.

#### Analysis Procedures

The 238 twin pairs were divided into two subsamples (called "Sample 1" and "Sample 2") for analysis. Each subsample contained one twin from each pair. This procedure was employed because shared genetic and environmental factors could produce dependence in the scores of twins from a single pair. This dependence would make it difficult to establish the degrees of freedom for estimating the

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TABLE 1. Haan-Kroeber Definitions of Coping and Defense Mechanisms\*

Generic Function	Coping Process	Defensive Process
Cognitive Processes Discrimination	Objectivity: Separates ideas and feelings as required by situation. Can be consciously of two minds.	Isolation: Affect is not related to ideas, or seems unable to put ideas together. Unable to generalize, synthesize, or integrate meaningfully.
Detachment	Intellectuality: Can detach self from affect-laden situations to give impartial analysis, but still articulates and symbolizes feelings so they contribute to decisions and behavior.	Intellectualization: Retreats from affect into formulations of words and abstraction at level inappropriate to setting. (A subcategory of isolation.)
Means-ends	Logical analysis: Systematically analyzes causal aspects of situations, including motivational explanations.	Rationalization: Offers superficially plausible reasons for behavior that omit crucial aspects of situation; needs to offer causal explanations: including formulas, e.g., "It's fate."
Self-reflexive processes Delayed response	Tolerance of ambiguity. Can make qualified judgments and deal with cognitive and affective complexity and uncertainty.	Doubt and indecision: Unable to resolve ambiguity or choose course of action; hopes problems will solve themselves; worries about past decisions and behavior.
Sensitivity	Empathy: Puts self in the other person's shoes and can imagine how they feel; takes others' feelings into account in making decisions.	Projection: Attributes objectionable tendency of self to another and does not recognize it as part of self.
Time reversion	Regression in service of the ego: Utilizes feelings and ideas that are not part of the practical requirements of the situation to give better insight into problems and situation.	Regression: Resorts to evasive, wiseful, demanding, dependent, ingratiating, nonage appropriate behavior to avoid responsibility, aggression, or unpleasant demands.
Attention-focusing Processes Selective awareness	Concentration: Sets aside disturbing or attractive feelings or thoughts to concentrate on task at hand.	Denial: Denies present or past facts or feelings that would be painful to focus on benign or pleasant ones.
Affective Regulation Diversion	Sublimation: Finds self-satisfying, socially acceptable means of expressing "primitive" affect.	Displacement: Tries to control affects or impulses in relation to original object, then expresses them inappropriately in a more tolerant situation.

(continued)

**Table 1. (continued)**

<i>Transformation</i>	<i>Substitution:</i> Expresses tempered, domesticated feelings that are appropriate, flexible, metered, and purposive.	<i>Reaction formation:</i> Appears to have transformed "primitive" impulses and feelings into opposites, but expression of both is excessively civilized, and sometimes breaks down.
<i>Restraint</i>	<i>Suppression:</i> Infeasible, inappropriate affect and feelings are controlled until time, place, and object are proper for expression.	<i>Repression:</i> Unconsciously and purposefully forgets, and is unable to remember past, or cannot elaborate.

<sup>a</sup>The definitions are based on information in Haan (37) and are used with permission of Academic Press.

**TABLE 2. Correlations Between Measures of Type A Behavior Pattern<sup>a</sup>**

Interview	JAS A-B		JAS S		JAS J	
	Sample 1	Sample 2	Sample 1	Sample 2	Sample 1	Sample 2
Interview	—	—	—	—	—	—
JAS A-B	0.48**	0.29**	—	—	—	—
JAS S	0.36**	0.19*	0.52**	0.57**	—	—
JAS J	0.15*	0.10	0.33**	0.46**	0.16**	0.38**
JAS H	0.01	0.17*	0.41**	0.38**	0.13*	0.13*
					0.11*	0.08

<sup>a</sup>Note: N is between 149 and 154 inclusive for the interview correlations. N is between 228 and 232 inclusive for the JAS score correlations. \* $p < 0.05$ ; \*\* $p < 0.01$ .

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significance of statistical findings. By including only one twin from a pair in each subsample, the twin pair becomes the unit of sampling. Each pair can be regarded as being independently sampled, so the degrees of freedom for the analyses are readily established. Carrying out the analysis in each subsample provides a partially independent replication of any "significant" findings. Relationships that were not found to be significant in each subsample were not considered significant. The two subsamples did not differ significantly on either the Hollingshead scales for education or occupation.

All analyses were performed using the Statistical Package for the Social Sciences (SPSS) (39). Because two samples were employed in the analyses, a special format has been used to present results in the text. The format gives the correlation for Sample 1, followed by the correlation for Sample 2, with the two separated by a slash (e.g.,  $r = 0.25/0.30$ ). Each correlation reported is significant beyond the 5% level and most beyond the 1% level.

### RESULTS

Table 2 presents the correlations between the measures of Type A. From this table, it is clear that the TABP assessed by the interview is moderately related to JAS A-B ( $r = 0.48/0.29$ ) and slightly related to JAS S ( $r = 0.36/0.19$ ). The remaining JAS scales have little relation to the interview ratings ( $r < 0.19$ ). The JAS A-B scale is significantly related to each of the other three JAS scales, but the specific elements of TABP measured by the JAS are largely independent.

Measures of the general TABP were not strongly related to coping and defense mechanisms. The Type A interview was related to suppression ( $r = -0.18/-0.23$ ). The JAS A-B was significantly related to suppression ( $r = -0.23/-0.23$ ) and to substitution ( $r = 0.13/0.18$ ), intellectualization ( $r = 0.17/0.32$ ) and primitive defense ( $r = -0.20/-0.21$ ). Each of these observed correlations may be explained by the association between the TABP

measures and the specific elements of the pattern. The specific elements are much more strongly related to coping and defense than is the overall pattern (see below) and partial correlations controlling for JAS S, JAS J, and JAS H reduced each of the above correlations to nonsignificance.

Partial correlations were used to determine the association of specific JAS elements of TABP to defense and coping. The association between one JAS scale, JAS J, for example, and the coping and defense mechanisms was determined holding the other two JAS scales, JAS S and JAS H, constant statistically. This procedure clearly isolates any significant relationship resulting from a unique association between the specific Type A element and the ego mechanisms in question. The procedure is also consistent with the initial scale development that derived these scales as orthogonal factors. The analysis results are presented in Table 3 for coping mechanisms and Table 4 for defense mechanisms.

JAS S was correlated to regression in service of the ego ( $r = 0.27/0.30$ ), suppression ( $r = -0.26/-0.22$ ), isolation ( $r = 0.20/0.17$ ), rationalization ( $r = 0.17/0.25$ ), regression ( $r = 0.16/0.17$ ), and displacement ( $r = 0.35/0.22$ ).

JAS J was positively related to 7 of the 10 coping mechanisms and negatively related to 5 of the 10 defense mechanisms. JAS J was positively related to all three summary coping measures and negatively related to summed defense ( $r = -0.25/-0.26$ ) and primitive defense ( $r = -0.25/-0.34$ ). The general pattern of a positive association to coping and negative association to defense was contradicted only by positive relationships to intellectualization ( $r = 0.50/0.50$ ) and structured defense ( $r = 0.25/0.19$ ).

TABLE 3. Partial Correlations Between Coping Mechanisms and Type A Behavior Measures<sup>a</sup>

Coping Mechanisms	Type A Behavior Measure					
	JAS S <sup>b</sup>		JAS P <sup>b</sup>		JAS H <sup>b</sup>	
	Sample 1	Sample 2	Sample 1	Sample 2	Sample 1	Sample 2
Objectivity	-0.06	0.07	0.36**	0.30**	-0.11	-0.11
Intellectuality	-0.01	0.04	0.43**	0.43**	-0.14*	-0.12
Logical analysis	-0.06	0.12	0.32**	0.26**	-0.08	0.02
Concentration	-0.04	-0.02	0.24**	0.22**	0.06	0.05
Tolerance of ambiguity	-0.08	0.05	0.27**	0.31**	-0.22**	-0.20**
Empathy	-0.08	-0.08	0.01	0.04	-0.24**	-0.07
Regression in service/ego	0.27**	0.30**	0.07	0.13*	-0.25**	-0.31**
Sublimation	0.00	-0.16*	0.16*	0.28**	-0.02	0.04
Substitution	0.05	-0.01	0.37**	0.36**	-0.09	-0.12
Suppression	-0.26**	-0.22**	0.21**	0.10	-0.18**	-0.21**
Summed coping	0.02	0.06	0.29**	0.24**	-0.13*	-0.16*
Controlled coping	-0.23**	-0.11	0.38**	0.31**	-0.09	-0.07
Expressive coping	-0.03	0.04	0.15*	0.15*	-0.26**	-0.27**
Multiple R	0.448	0.488	0.512	0.527	0.336	0.409

<sup>a</sup>p<0.05; <sup>b</sup>p<0.01.

<sup>b</sup>Controlling for the other two JAS scales.

TABLE 4. Partial Correlations Between Defense Mechanisms and Type A Behavior Measures<sup>a</sup>

Defense Mechanisms	Type A Behavior Measure					
	IAS S <sup>b</sup>		IAS P <sup>b</sup>		IAS H <sup>b</sup>	
	Sample 1	Sample 2	Sample 1	Sample 2	Sample 1	Sample 2
Isolation	0.20**	0.17**	0.07	0.04	0.12	0.01
Intellectualization	0.02	0.11	0.50**	0.50**	-0.12	-0.11
Rationalization	0.17**	0.25**	-0.22**	-0.25**	0.07	0.05
Denial	-0.09	-0.25**	-0.14*	-0.05	0.10	0.15*
Doubt	0.06	0.16*	-0.28**	-0.40**	-0.03	-0.03
Projection	0.12	0.16*	-0.30**	-0.28**	0.20**	0.15*
Regression	0.16*	0.17**	-0.11	-0.15*	-0.07	-0.12
Displacement	0.35**	0.22**	-0.28**	-0.25**	0.04	0.04
Reaction formation	-0.02	0.02	-0.09	-0.05	0.16*	0.00
Repression	-0.05	-0.15*	-0.31**	-0.40**	0.15*	0.06
Summed defense	0.07	0.03	-0.25**	-0.26**	0.03	-0.11
Structured defense	0.05	0.10	0.25**	0.19**	-0.17**	-0.19**
Primitive defense	0.02	0.10	-0.25**	-0.34**	-0.09	-0.17**
Multiple R	0.444	0.502	0.530	0.588	0.298	0.314

<sup>a</sup>p<0.05; <sup>b</sup>p<0.01.

<sup>c</sup>Controlling for the other two IAS scales.

JAS H was related primarily to lower scores for coping mechanisms. Significant correlations were found for tolerance of ambiguity ( $r = -0.22/-0.20$ ), regression in service of the ego ( $r = -0.25/-0.31$ ), suppression ( $r = -0.18/-0.21$ ), summed coping ( $r = -0.13/-0.16$ ), and expressive coping ( $r = -0.26/-0.27$ ). Significant correlations to defense measures were found for projection ( $r = 0.20/0.15$ ) and structured defense ( $r = -0.17/-0.19$ ).

The pattern of findings for the three JAS factors is influenced by intercorrelations between the ego mechanism measures. This is evident from the fact that the multiple correlations in Table 3 and 4 are not a great deal larger than the largest of the individual correlations. More detailed investigation of these associations was not undertaken in this study for several reasons. Theoretically, defenses or coping mechanisms can occur in interdependent patterns (40, 41). If it is a pattern as a whole that is related to a given element of TABP, multiple regression analysis may produce meaningless results (42). Even if patterns of mechanisms are not considered critical to theory, intercorrelations will introduce difficulties in the interpretation of individual regression weights (43). At present, the theoretical basis for associations between TABP and ego mechanisms is not sufficiently developed to apply path analytic techniques that could help solve this problem (44). The data do clearly indicate general trends for the relationship between TABP elements and coping and defense. These trends are appropriate to the hypotheses under investigation. Obviously, caution is needed in interpreting the individual correlations to specific mechanisms.

The general trends for the three specific JAS factors are summarized in Table 5. JAS S was associated primarily with high

defense mechanism scores. JAS J was associated with high coping mechanism scores and low defense scores. JAS H was associated with low coping scores. These trends represent factor-specific relationships as only six ego mechanisms were significantly related to two JAS dimensions and no mechanism was related to all three. In combination, the three JAS dimensions were associated with most of the ego mechanisms. Only empathy, denial, and reaction formation produced no significant correlations.

## DISCUSSION

The results of this study supported two of the hypotheses proposed in the introduction. JAS J was associated with higher scores for coping mechanisms and JAS S was associated with higher scores for at least some defenses. The results did not support the hypothesis that TABP would be associated with higher scores for defense mechanisms. The findings also indicated that JAS H was associated with

TABLE 5. JAS Scales for Specific Pattern Elements: Association to Coping, Defense, and Coronary Heart Disease

	JAS Scale		
	S	J	H
Coping mechanisms <sup>a</sup>	0	+	-
Defense mechanisms <sup>a</sup>	+	-	0
Coronary heart disease <sup>b</sup>	+	--	+++

<sup>a</sup>A "+" was assigned when there were four or more significant positive correlations and a "-" for four or more significant negative correlations. In no case were there both four significant positive and four significant negative correlations.

<sup>b</sup>Entries refer to direction of association and strength based on three studies (5-7). Pooled significance levels (10) were  $0.03 < p < 0.15$  for JAS S,  $p < 0.02$  for JAS J, and  $p < 0.001$  for JAS H.

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lower coping skills and that JAS J was associated with lower scores for defenses. These findings are instructive with respect to the possible psychological dynamics of TABP and CHD risk.

The prediction that TABP would be associated with higher scores on defenses was based on several trends in the Type A literature. It was therefore surprising to find that TABP was not related to defense mechanisms. The only consistent tendency for the two overall TABP measures was a negative relation to suppression. While this association is consistent with the possibility that poor affect management may be a key element of TABP, it does not suggest a generalized inability to adjust to stress. Furthermore, even this negative association may be questioned in view of other findings that suggest a positive association between TABP and suppression (18-21). Deficiencies in adjustive capacity may not be a general facet of Type A behavior, but may be evident only when the Type A individual faces those stresses that activate the behavior pattern. Such a possibility is reasonable, because an individual's coping and defense style may vary somewhat from one situation to another (45). The coping and defense measures employed in this study probably represent traits and may be insensitive to situational-specific differences in coping and defense. However, prior use of situation-specific measures has also failed to show strong differences between Type A's and Type B's (ref. 21; see also footnote 2 above).

The general independence of TABP from coping and defense extends prior trends indicating that Type A is not related to common personality concepts (46). If this independence is not entirely attributable to phenomenon such as situation specificity in the use of defenses, it

suggests an issue for future research. In the present instance, independence implies that a Type A person can have either high or low adaptive skills. Noting that not all Type A individuals have heart attacks, it may be suggested that increased CHD risk occurs not because Type A's adapt poorly, but when they do. For example, in a study by Jenkins et al. (5), CHD risk was particularly high when JAS A-B and JAS H were also high.<sup>3</sup> Treating JAS A-B as an approximation of TABP and noting that JAS H is associated with lower coping skills, this could be interpreted as evidence that risk is elevated when TABP is combined with poor coping skills. The implication of this interpretation would be that future studies of psychosocial CHD risk should include multiple risk factors just as current studies of physiological CHD risk do.

The results of the present study also indicated that TABP was independent of some of the specific behaviors which are conceptually part of the pattern. This independence was indicated by the small correlations between TABP measured by the standard interview, the best criterion for the pattern, and the specific pattern elements measured by the JAS. The apparent independence of TABP and its stipulated elements is a basis for concern

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<sup>3</sup>A calculation by the present authors indicates that CHD risk was elevated only when high JAS A-B and JAS H scores occurred in combination ( $\chi^2=5.55$ , 1 df,  $p<0.025$ ). It is based on the difference between the observed and expected frequencies of coronaries in this group only. The remaining three categories then produce a pooled  $\chi^2$  of 2.67 (2 df,  $p$ , not significant). Thus, it may tentatively be concluded that it is particularly the combination of high AB scores with high "Hard-driving" scores that produces increased risk. This clearly implies an interaction rather than a simple additive effect.

in Type A research. If the pattern is not comprised of these particular elements, it is natural to ask what its components are. This brings us back to Cobb's point that more attention must be given to determining the dynamics of TABP (2).

A discussion of all the factors that may play a part in the low correlations between TABP and the specific JAS scales would be out of place in this article, but one possible explanation that has implications for the association between coping and defense mechanisms and TABP should be considered. Correlational analyses such as those used in this study are appropriate for relating judgments to symptoms only if the judgments are arrived at by summing the symptoms. Clinical judgments are more likely to reflect configural evaluations of symptoms in which the impact of a given symptom on the overall judgment depends on which other symptoms are present and how pronounced they are. In such a case, different analytical approaches are needed to determine the impact of a particular symptom on the final judgment made by a clinician (47). Whether configural factors are important to TABP is a question for future study. If this were the case for specific symptoms and TABP, the issue of the association between TABP and coping and defense would be reopened. Some association would then be implied from the relationship between coping and defense and the specific elements of TABP that were observed in this study.

The fact that specific ego mechanisms were related to the individual JAS factors is an important consideration for future research. If the Type A interview had been examined in terms of specific components that have been shown to be related to CHD risk (48), these components might also have proven to be related to coping and

defense.<sup>4</sup> This would further implicate coping and defense in CHD risk. Furthermore, the same point can be applied to the previous finding that overall Type A classification was only slightly related to situation-specific measures of coping and defense (21). A combined analysis approach of analyzing the relationship between specific elements of TABP and situation-specific measures of defense and coping taken under conditions that activate the TABP might show strong associations between TABP and coping and defense.

The present findings provide insight into the psychological dynamics of CHD risk no matter what the final resolution of the relationship between TABP and the JAS factors may be. The combined results of previous studies indicate that the specific JAS scales are related to CHD risk such that psychological factors associated with the JAS scales may contribute to CHD risk (5-7).<sup>5</sup> Table 5 combines the trends from the JAS studies with the find-

<sup>4</sup>The authors thank an anonymous reviewer of an earlier draft of this article for suggesting this point.

<sup>5</sup>The combined results of studies by Jenkins et al. (5), Kenigsberg et al. (6), and Zyzanski et al. (7) show that "Hard-driving" is positively associated with CHD risk ( $p < 0.001$ ) and that "Speed and Impatience" tends to be associated with increased CHD risk ( $0.03 < p < 0.15$ ). The determination of the combined probability of these three independent observations was made using several tests described by Rosenthal (10). These included the method of adding probabilities, the method of adding  $t$ s, the method of adding  $Z$ s, and the method of adding weighted  $Z$ s. As described by Rosenthal (10), the other methods mentioned have logical or practical limitations for the present purposes. The probability indicated for "Hard-driving" is the largest chance probability assigned to these findings by any of the tests employed. The frequently used Fisher test would provide a significance estimate of  $p < 0.05$ . The values provided for "Speed and Impatience" represent the range of results for the significance estimates.

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ings of the present study. JAS H and JAS J have the strongest associations to CHD risk and both are related to coping mechanisms. The direction of the associations suggests that CHD risk is elevated in those with poor coping skills. A more tentative inference would be that CHD risk is associated with higher defensiveness. JAS S is associated with higher defense mechanism scores, but only marginally related to CHD risk. JAS J is related to lower defense mechanism scores and lower CHD risk, but this association may be secondary to the relationship between JAS J and coping mechanisms. Overall, the pattern of findings in Table 5 provides indirect support for theories asserting that coping will be related to good health and defenses to poor health (e.g., refs. 16 and 37). The pattern also raises some questions concerning whether it is the absence of coping skills, presence of defensiveness, or both that contribute to CHD risk. At present, the associations are inferential; a need for direct study of these issues is apparent.

Conclusions based on the data presented here are necessarily tentative. The findings must be replicated to insure their generality as the sample of men studied may not be widely representative of other populations of interest in Type A research. Similarly, although the initial scale validity studies for the coping and defense measures have been promising, subsequent studies may indicate needed refinement or even reinterpretation of some of the scales. This possibility seems particularly likely when considering individual scales, which is another reason why specific defense and coping mechanisms correlates of TABP elements have not been explored in detail at this time. As noted previously, a major reason for limiting the attention given to specific

ego mechanisms was that the original hypotheses were phrased broadly in terms of coping and defense. The findings can therefore be regarded as exploratory with respect to specific mechanisms and should be useful in developing testable hypotheses for future study of the dynamics of TABP. The general congruence between the initial hypotheses and the study findings suggests that the results are not purely artifactual. However, these methodological and theoretical limitations deserve attention in future research relating TABP to coping and defense.

### SUMMARY

The known association between Type A behavior pattern (TABP) and coronary heart disease (CHD) risk may be due to deficient coping and/or excessive defensiveness on the part of Type A's. Based on descriptions of TABP and the results of prior research, it was hypothesized that the overall TABP would be associated with higher defensiveness. The specific components of TABP measured by the Jenkins Activity Survey (JAS) were also considered, because they can provide detail concerning the dynamics of TABP and are related to CHD risk in their own right. It was hypothesized that JAS "Speed and Impatience" would be related to higher defensiveness and JAS "Job Involvement" would be related to higher coping.

These hypotheses were tested in a sample of middle-aged male twins. Overall TABP was measured by the Structured Interview and the JAS A-B scale. Specific TABP elements were measured by the JAS. Coping and defense were measured with scales developed from the California Psychological Inventory. Global TABP

was not related to higher defensiveness, but was related to lower suppression. "Job Involvement" was strongly related to higher coping skills and to lower defenses in general. "Speed and Impatience" was related to higher defense scores and "Hard-driving" to lower coping scores, but these relationships were more selective than the findings for "Job Involvement."

One implication is that poor coping and high defensiveness may contribute to increased CHD risk. This possible association is inferred from the pattern of relationships between the specific JAS elements and coping and defense, and CHD risk. A second implication is that Type A individuals may be at greatest risk of CHD when they lack adequate coping skills or are excessively defensive. TABP is therefore associated with increased CHD risk

not because of poor adjustive skills, but when it is accompanied by them. Finally, the findings point to the importance of multifactorial interactions between personality variables as determinants of CHD risk. This point should be taken into account in the design of studies relating personality to CHD risk.

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