HARDINESS, SENSE OF COHERENCE, AND POTENCY: THEIR RELATIONSHIP TO EACH OTHER, AND TO HEALTH PRACTICES

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Hardiness, Sense Of Coherence, And Potency: Their Relationship To Each Other, and to Health Practices

by.

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Abstract

In recent years, considerable attention has been paid to personality dimensions as modifiers of the stress-illness relationship. Included amongst those modifiers investigated have been hardiness, sense of coherence, and potency. The purpose of this study was to investigate the apparent similarity among these three constructs, and among their components. As well, the relationship between the three personality constructs and the occurrence of health protective behaviours was examined.

Questionnaires measuring the personality constructs and health behaviours were administered to 314 subjects. The results indicated that there was a positive and substantial relationship among the three personality constructs, and among their components. The hypothesized relationship between the personality constructs and health protective behaviours was also supported.

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Introduction

Although the experience of stress is a common one, its definition and systematic study has proven difficult. For several decades, there has been great interest in and mounting evidence for the support of the relationship between stressful life events and both physical and psychological morbidity (cf., Dohrenwend and Dohrenwend, 1974; Gunderson and Rahe, 1974; Bieliauskas, 1982). However, many studies have demonstrated that this correlation, while statistically significant, tends to be rather low in magnitude (cf., Rabkin and Struening, 1976). Apparently, not everyone experiencing life changes that are usually considered stressful actually responds in the same way. Stressful life events appear to be associated with debilitating effects for some people, but not for others.

Such discrepancies in response to stressful events indicate that the relationship between stressful events and the occurrence of illness (physical or psychological) may be moderated by other variables. Consequently, there has been a thrust toward the study of "resistance resources" (Antonovsky, 1979), and the attempt to specify those buffering or moderating variables thought to be responsible for the decrease or neutralization of the debilitating effects of stress. Plausible moderators that have been investigated include:

(1) constitutional strengths such as history of family illness (Selye, 1956; Kobasa, Maddi and Courington,

1981), and the characteristics of the immune system (Oettgen, 1977),

(2) various forms of social support (Cobb, 1976; Katz and Kahn, 1978; Antonovsky, 1979; Wilcox, 1981; Holahan and Moos, 1985),

(3) demographic variables such as income (Luborsky, Todd, and Katchen, 1973), social class (Antonovsky, 1968), and marital status (Carter and Glick, 1970; Myers, Lindenthal and Pepper, 1975),

(4) various health practices or health protective behaviours (McCaul, Solomon and Holmes, 1979; Alterkrause and Wilmore, 1973), and

(5) various personality dimensions such as coping (Lazarus, 1966; Lazarus and Cohen, 1977; Mischel, 1973; Holahan and Moos, 1985; Scheier and Carver, 1985), control (Weiss, 1971; Averill, 1973; Seligman, 1975; Phares, 1976), locus of control (Rotter, 1966; Lefcourt, 1976; Krause and Stryker, 1984), powerlessness (Seeman, 1972), and self-confidence (Holahan and Moos, 1985).

Thus, there have been a variety of physiological, sociocultural, and psychosocial moderators suggested.

In spite of the variety of resistance resources studied, most attention has been directed towards personality factors or dimensions. It is apparent that the demand placed on the individual by a stressful event is not necessarily the stressor. Rather, the person's subjective perception of the event (as well as their perception of

their own capability and adequacy in dealing with the demand) are more likely to determine the severity of the demand. Thus, characteristics of the individual were recognized as interacting with the characteristics of the situation in their effects upon the stress-illness relationship, reflecting the interactionist view. Kobasa (1982), for example, states that

> the basic notion throughout the research has been that, persons' general orientations toward life or characteristic interests and motivations would influence how any given stressful life event was interpreted and dealt with and, thereby, the event's ultimate impact on the physiological and biological organism (p. 6).

Kobasa (1979) and Antonovsky (1979) have taken similar approaches to the study of personality as a moderator of stress. They have investigated this relationship using a combination of personality traits/dimensions, rather than a single personality trait such as "control". The composite constructs posed by these researchers have been referred to as "hardiness" and "sense of coherence", respectively. These two constructs, however, seem to be somewhat similar in terms of the definitions of their components, the manner in which they are postulated to intervene in the stress-illness relationship, and the means by which they are thought to develop. In addition, Ben Sira (1985) has proposed yet another composite construct "potency", which by

definition appears to be similar to hardiness and coherence, but which is purported to intervene at a different point in the coping-stress-disease relationship.

One mechanism by which such constructs as hardiness, sense of coherence and potency might act as buffers of stress reactions is through their effects on the practice of health promoting behaviours. In recent years, it has become quite apparent that an individual's behaviour can have significant implications for his or her health status. While preventive actions can incorporate different types of behaviours, what is generally referred to as primary prevention encompasses "all actions and technology to prevent disease prior to occurrence" (Leventhal and Hirschman, 1984). On a personal level, such actions could include individual choices and life-style patterns, more commonly referred to as health practices, or the practice of health protective behaviours. Although there are a number of definitions of health behaviour, this study utilized the definition posed by Kasl and Cobb (1966) as "any activity undertaken by a person believing himself to be healthy, for the purpose of preventing disease or detecting it in an asymptomatic state" (p. 246). More specifically, health behaviours include attention to diet, regular exercise, substance-use, hygiene etc. The practice of such health protective behaviours has also been posed as a stress mediator (as alluded to earlier).

The apparent conceptual similarities of the constructs of hardiness, sense of coherence and potency, and their commonly postulated relationship to reactions to stress suggest the need for an investigation of their interrelationship to one another. Furthermore, the possible role of health behaviour as a buffer of stress suggests the importance of examining whether any or all of these three constructs are related to the practice of health behaviour.

The Three Constructs and Their Components

Kobasa (1979, 1982), using both retrospective and prospective designs, found that when life events are stressful, the personality construct "hardiness" is associated with a decrease in the number and the severity of illnesses reported. She also found that, when prior illness is controlled for, stressful life events are associated with an increase in illness, and that the personality trait "hardiness" is associated with a decrease in illness. Hardiness, for Kobasa, is a constellation of three personality dimensions/dispositions:

(1) commitment - the ability to believe in the truth, importance, and interest value of who one is and what one is doing and thereby the tendency to involve oneself in the many situations of life; a sense of purpose and investment of self. Kobasa (1982) states that commitment to self "provides an overall sense of purpose that mitigates the perceived threat of any

given stressful life event in a specific life area" "...that commitment serves as a buffer" (p. 6);

(2) control - the tendency to believe and act as if one can influence the course of life events through imagination, knowledge, skill, and choice. Feeling capable of acting effectively allows the individual to "interpret and incorporate various sorts of events into an ongoing life plan and transform these events into something consistent and not so jarring to the organism" (p. 7);

(3) challenge - the belief that change, not stability, is the norm in life, and that the anticipation of change is an incentive to growth. According to Kobasa, "challenge leads persons to be catalysts in their environment and to practice responding to the unexpected"... further, they are characterized by an "openness or cognitive flexibility and tolerance of ambiguity", allowing them to integrate and appraise effectively the threat of even the most unexpected stressful experience" (p. 8).

Each of these three components is postulated to influence reactions to stress through both cognitive appraisal and action. That is, they provide a basis for interpreting stimuli in a less threatening way and for the instigation of appropriate behaviours for dealing with potential stressors. Kobasa (1982) acknowledges that there are both similarities and differences among the three

components, but claims that together, they can be "viewed as interlocking parts of an overall orientation or style of resistance .... 'hardiness" (p. 8). Her research has shown that there is a significant interaction between stress and hardiness, and thus, according to Kobasa, it is "crucial for one's health to be hardy when one is undergoing an intensely stressful time" (p. 15).

Antonovsky (1984) suggests the construct of "sense of coherence" as a moderator of the stress-illness relationship. He argues that the greater one's sense of coherence the more one "can avoid threat or danger" (p. 120), and that upon confrontation with a noxious event the more likely one is to appraise the event as being a potential "challenge worthy of the investment of energy, and as situations that can be managed well" (p. 121). Sense of coherence is defined as a generalized "orientation that expresses the extent to which one has a pervasive enduring though dynamic feeling of confidence that one's internal and external environments are predictable ... and that there is a high possibility that things will work out" [reasonably well]. Included within this construct are three components:

(1) comprehensibility - the extent to which stimuli are perceived to make cognitive sense i.e., ordered, consistent, structured and clear, rather than as chaotic, disordered and accidental. The extent to which future stimuli (regardless of its nature) are perceived as predictable, or order-able when they do

occur,

(2) manageability - the extent to which the resources at one's disposal are perceived to be adequate to meet demands (i.e., resources under one's own control, or the control of others but which may be counted upon). The extent to which life events (regardless of their nature i.e., desirable or undesirable) can be dealt with, and

(3) meaningfulness - the extent to which one feels that life "makes sense emotionally", and is hence, worthy of the investment of energy and commitment; is challenging, rather than burdensome.

Antonovsky acknowledges that the three components are "inextricably intert"inextricably intertwined" (p. 120) and that the separation of the three is only useful for analytical purposes i.e., an individual may differ somewhat with respect to the extent to which he possesses or exemplifies each component.

While acknowledging that conclusions about causality cannot be drawn on the basis of cross-tabulation data, Antonovsky (1983) has found that estimates of current health status and measurement of sense of coherence in a national survey offer strong support for the hypothesized relationship between sense of coherence and positive health.

It would seem, on the surface at least, that the constructs, hardiness and coherence, are very similar in nature; that together, the components of each construct are responsible for the individual having an underlying sense of self-confidence in his or her capacity to overcome the potentially stressful demands of life. People for whom hardiness is a strong personality dimension, and people who have a strong sense of coherence are presumably more likely to cope more adequately with stresses and thereby experience less stress.

The separate components of hardiness and coherence are also similar. For example, Antonovsky's "manageability" appears to be related to Kobasa's "control". However, as Antonovsky (1984) acknowledges, Kobasa's control refers to the individual's sense of his or her own control of resources, whereas manageability seems to extend the notion to include resources "controlled by legitimate others ... upon whom one can count" (p. 18) e.g., friends, colleagues, God etc.

In my view, there is also a similarity between Kobasa's "commitment" component and Antonovsky's "meaningfulness". Within both definitions is the notion of involvement on the part of the individual (presumably because it is deemed that some event or action is worthy of the investment of energy or caring) as opposed to alienation, and/or feeling it is not worth the investment of energy. Also, in describing meaningfulness, Antonovsky refers to problems and demands of

life being perceived as challenges rather than burdens, while for Kobasa, challenge is one of the components comprising hardiness.

The presumed developmental patterns of hardiness and coherence are likewise similar. Kobasa (1982) suggests that hardiness has as its source a wide variety of experiences in early life, stimulation and support for exercising one's capabilities, approval and admiration for showing initiative, and role models who exemplify and advocate hardiness. Antonovsky separates the proposed sources of coherence according to each of the three components. Thus, the extent to which a given life experience is consistent with previous or contemporary life experiences, or is predictable, is related to one's sense of comprehensibility. The extent to which life experiences are appropriate to one's capacities (i.e., underload - overload balance) is related to one's sense of manageability, and the extent to which one participates in decision-making regarding one's own experiences is related to the meaningfulness component of coherence. Both Kobasa and Antonovsky acknowledge the relevance of Bandura's (1977) concept of self-efficacy to their constructs.

Ben-Sira (1985) proposes a third construct, "potency", which he defines as

> a person's enduring confidence in his own capacities as well as confidence in and commitment to his/her social environment, which is perceived

> as being characterized by a basically meaningful and predictable order and by a reliable and just distribution of rewards (p. 399).

Ben-Sira describes potency as an "experience- based confidence both in one's capacities to cope with demands and that things usually work out reasonably well" (p. 398). He further states that

> in operational terms, potency comprises the mechanisms of self-appreciation and mastery...on the one hand, and committment to society (in contrast to alienation)..., as well as a perception of society as meaningful and ordered (in contrast to anomie)..., on the other (p. 399).

Respectively, these three components of potency refer to notions posed by Pearlin and Schooler (1978), Seeman (1959, 1972), Seeman and Seeman (1983), and Srole (1956), and are reflected in the test items of the Potency scale.

Ben-Sira acknowledges that the construct of potency is similar to other constructs posed by other theorists/researchers (Kobasa 1982; Antonovsky, 1979; Seligman, 1975; Pearlin and Schooler, 1978; White, 1959). Indeed the two major components consisting of potency (i.e. mastery and commitment), although not explicitly defined by Ben-Sira (1985), seem to be similar to those of Kobasa's hardiness and Antonovsky's sense of coherence. The source of this construct appears to be highly similar to that of

Kobasa's "hardiness" and Antonovsky's "coherence" in that it develops as a result of past experiences. Specifically, it develops as a result of rewarding experiences or successes, tempered with some frustration, punishment, and failures.

Given that past coping experiences play a major role in the development of the constructs hardiness, coherence, and potency (as is either implied or explicitly stated by their proponents), then it is conceivable that the three theoretical constructs are one and the same. It is the purpose of this study to assess that possibility.

The Relationships Between the Constructs and Health Behaviours

In terms of the possible connection between the three personality constructs and the practice of health protective behaviours, it would seem plausible that the more confidence that an individual has in his or her overall capacity to deal with stressful events, and the more active his or her approach to problem-solving (as opposed to passivity), the more likely he/she is to engage (intentionally or otherwise) in behaviours that are facilitative of his/her health.

Kobasa (1982) refers to the possible relationship between hardiness and the practice of health protective behaviours by stating that

> hardy persons (by virtue of their generally disciplined and realistic approach) might engage

> most conscientiously in positive health practices. In contrast, persons low in hardiness might exaggerate constitutional predisposition by engaging in negative health practices ... .(p. 176)

Kobasa also states that

> challenge [a component of hardiness] will lead to attempts to transform oneself and thereby grow, rather than conserve and protect what one can of the former existence. (p 170)

It is my view that health practices can be interpreted as attempts on the part of the ... individual to "transform ... and thereby grow", as health practices have been shown and are purported to be facilitative of one's health status (Belloc and Breslow, 1972; Berkman and Breslow, 1983). The relationship between hardiness and health practices has been previously investigated by Weibe and McCallum (1986) and Hannah (1988). Their results, however, were inconsistent. Weibe and McCallum concluded that hardiness may work indirectly through health practices to affect illness. Hardy individuals may remain more healthy under stress because they engage in more and better health behaviours than nonhardy individuals. On the other hand, Hannah found no overall relationship between hardiness and health behaviours but did find a significant interaction between hardiness and health concern. It would appear that hardiness is significantly related to health behaviour for those individuals with a high concern for health as opposed

to those with a low concern for health.

Antonovsky (1984) is even more explicit than Kobasa in referring to the possible relationship between sense of coherence and subsequent health behaviours. He argues that while people differ in their potential resources, these are of little or no use unless people avail of them. People "differ significantly in the readiness and willingness to exploit the resources that they have at their potential disposal" (p. 121). Antonovsky claims that this is what distinguishes people with a stronger versus a weaker sense of coherence. People with a stronger sense of coherence are more likely to search hard for potential coping resources, while those with a weaker sense of coherence are more likely to cease to look. He states that it is reasonable to expect differences in health practices between people with a stronger sense of coherence and those with a weaker sense of coherence. For example, people with stronger sense of coherence would be more likely to approach self-help groups or actively participate in transforming environmental conditions.

Ben-Sira does not explicitly state a possible relationship between potency and the practice of health behaviours. However, it can be argued that if stress precipitates health damaging behaviours (e.g., smoking, substance use, overeating) and if potency reduces stress, then potency might be related to the practice of health behaviours. More specifically, if people have strong

potency, they might be less likely to engage in health damaging behaviours, and vice-versa.

The Purpose of the Present Study

It would seem then, that the three composite constructs of hardiness, coherence and potency are highly similar in composition in that all three involve an underlying sense of self-confidence on the part of the individual, in his or her capacity to overcome the stressful demands of life. Therefore it is possible and plausible that all three theoretical constructs may be descriptors of the same entity. To the extent that this is so (thereby reflecting an active approach to influencing one's own condition as opposed to passivity), and given the seeming pervasive nature of the three constructs, it is conceivable that the presence of such personality dimensions (as described by the three constructs) might be related to the practice of health protective behaviours. The present study attempted to investigate the existance of relationships among the three composite constructs (i.e., among the overall constructs, and among their components), and among the three constructs, their components, and the occurrence of health protective behavior.

Hypotheses

In light of the above review, the following hypotheses were formulated:

1. Overall scores on the three scales (measuring the composite constructs of hardiness, sense of coherence, and potency) would be significantly, positively, and substantially related.
2. Intercorrelations of scores on some of the components of the hardiness, coherence, and potency constructs would be statisticaly reliable. More specifically, it was expected that twelve of the twenty-eight possible intercorrelations, because their descriptions were similar, would be significantly different from zero, as indicated below:

Construct	Component	1	2	3	4	5	6	7	8
Hardiness	1. Control				*		*	*	
	2. Commitment					*			*
	3. Challenge					*	*		*
Coherence	4. Manageability							*	
	5. Meaningfulness								*
	6. Comprehensibility							*	*
Potency	7. Mastery								
	8. Commitment								

Note. * indicates expected correlations

3. Overall scores on the scales measuring the three composite constructs would be significantly and positively related to the practice of health protective behaviours.

Method

This present study explored the relationship among the three personality constructs of hardiness, sense of coherence, and potency, and their relationship to health protective behaviours. The respondents received a set of five questionnaires, three of which measured the extent to which they possessed the three personality constructs, and the other two measured the extent to which they practiced health protective behaviours. Subjects were also asked to provide demographic information. A description of the subjects, instruments, and procedure follows.

Subjects

It had been previously determined that a minimum sample size of 200 would allow estimation of the magnitude of correlation within a confidence interval of .12 (e.g. the 95% confidence interval for a correlation of .50 would be between the .44 and .56 confidence limits). However it was decided to increase the sample size by approximately 100, to allow for attrition.

The total sample of 314 subjects utilized in this study was a sample of convenience. Two hundred and one of these were students at the Cabot Institute of Applied Arts and Technology, all of whom were registered in a required English course regardless of their major area of study (e.g. accounting, mechanics, business, electronics, computer

studies, motor vehicles, etc.). The remaining 113 subjects were students registered in introductory and social psychology classes at Memorial University of Newfoundland.

While it is recognized that students may be different from the general population in that they are more likely to be young and healthy, there is no reason to suspect that they are different in terms of their personality dimensions or in terms of their tendancy to perform health protective behaviours.

The total sample was evenly divided as to gender; 165 (52.54%) males and 149 (47.45%) females. On the whole, subjects could be described as being young adults; the average age being 21 years, with 80.30% being between the ages of 18 and 22 years and 18.10% being over 22 years. Over half (64.20%) had completed grade 12, while 31.9% had completed grade 11. Of the 314 subjects, 113 (35.8%) had received training other than their current studies, and 201 (64.2%) had not.

Materials

Hardiness: The seventy-one item Hardiness measure (Kobasa and Maddi, 1982) assesses the extent to which an individual possesses the composite construct "hardiness". This scale is comprised of a combination of five scales from previously existing questionnaires: (a) the Alienation from Self scale from the Alienation Test (Maddi, Kobasa, and Hoover, 1979). High scores in this scale reflect a "lack of involvement

with one's distinctive skills, sentiments, and values and a passive attitude toward personal decision making and goal setting" (Kobasa, Maddi, and Kahn, 1982). (b) the Alienation from Work scale from the Alienation Test (Maddi et al., 1979). High scores reflect a "lack of personal investment in that area of life involving a socially productive occupation"... portraying "a general sense of meaninglessness, apathy, and detachment." (Kobasa et al., 1982). Together, these two scales (a and b, above) measure the commitment component of hardiness. (c) The External Locus of Control scale (Rotter, Seeman, and Liverant, 1962). This scale is a reliable and valid index of the belief in whether one is controlled by external forces (Phares, 1976). (d) the Powerlessness scale from the Alienation Test (Maddi et al., 1979). According to Kobasa et al. (1982), this scale is negatively correlated with dominance and positively correlated with trait anxiety, external locus of control, and conformism (Maddi et al., 1979). These scales (c and d, above) measure the control component of hardiness. (e) the Security Scale from the California Life Goals Evaluation Schedule (Hahn, 1966) measures the degree to which safety, stability, and predictability are deemed important. A low score on this scale would reflect a person's perception of changes as stimulating challenges to growth. Thus, this scale (e) measures the challenge component of hardiness.

Raw scores on each of the five scales described above were transformed into standard scores, as these scales had different origins. Since the challenge component of hardiness is indexed by only one scale (Security), its scores were doubled, and this weighted security score was then added to the other five scores to yield an overall hardiness scale. A low score on the hardiness scale reflects a high degree of hardiness.

The five scales of this composite measure of hardiness have shown moderately high intercorrelations and jointly define a large first factor (46.5% of the variance) in a principal components factor analysis (Kobasa et al., 1982). In addition, this hardiness composite has shown a stability correlation of .61 over a five year period (Kobasa, 1982).

In terms of discriminant validity, hardiness shows little or no relationship to stressful life events, job level, constitutional strengths, exercise, social supports, age, education, marital status, or religious practice. Thus, hardiness appears (both retrospectively and prospectively) to be a buffer, i.e., its presence (as measured by the Hardiness scale) decreasing the severity of illness symptoms associated with stressful life events (Kobasa, 1979; Kobasa et al., 1981; Kobasa, Maddi and Pucetti, 1982).

A copy of this instrument is presented in Appendix A.

Sense of Coherence: This is a twenty-nine item semantic-differential scale, measuring the extent to which an individual possesses the global orientation sense of coherence, as theoretically derived by Antonovsky. The scale, measuring a composite construct, consists of eleven items measuring the comprehensibility component, ten items measuring manageability and eight items measuring meaningfulness. A high score on this scale represents a strong sense of coherence.

Reliability data from a pretest (n = 83) of the scale by its author, using Cronbach's alpha, yield the following indices: sense of coherence (all 29 items) was .831; comprehensibility was .715; manageability was .511; and meaningfulness was .685. A test-retest reliability study (3 months later) yielded Pearson correlation coefficients of .627 for sense of coherence, .576 for comprehensibility, .436 for manageability, and .792 for meaningfulness.

In a subsequent and more heterogeneous national sample of 622 subjects, the Cronbach alphas reported were .828 for sense of coherence, .628 for comprehensibility, .636 for manageability, and .693 for meaningfulness.

Appendix B contains a copy of this instrument.

Potency: This is a nineteen-item scale, developed by Zeev Ben-Sira, to measure the theoretical construct "potency". This scale comprises a number of modified indicators of self-confidence and mastery, and of committment (the latter being a combination measure of alienation and anomie). Respondents are presented with statements to which they are required to indicate the extent of their agreement (1, very much agree... 6 very much disagree). A high score on this scale reflects a high degree of potency.

While there appears to be no report specifying the reliability and validity of this instrument, it does appear to measure a personality characteristic in the direction predicted by its author. Utilizing a method of smallest space analysis, Ben-Sira found that of all the predictors measured, the potency variable was one of the closest in space to the health variable. According to Ben-Sira (1985), the data supported the hypothesis that health can be predicted by potency; that "potency is associated with successful coping, which is predicted by the control of resources" (p. 401).

A copy of the Potency scale is presented in Appendix C.

Berkman and Breslow Index of Health Practices: This is a five-item scale measuring health practices (i.e., physical exercise, smoking behaviour, alcohol consumption, sleeping patterns, and obesity), originally developed as part of a 9-year longitudinal study (initiated by the U.S. National

Institute of Health) to investigate the relationship between health and ways of living (Berkman and Breslow, 1983).

Each of the five health practices are coded as dichotomous variables and scored as either 0 or 1. Respondents receive a health practices score based on the number of low-risk health practices reported. A high score reflects the direction of the more preferred behaviours. Berkman and Breslow (1983) state that while each of the health practices do not make an equal contribution to the risk of mortality, each behaviour is weighted equally in the scale (p. 92).

In calculating the body mass score on the Berkman and Breslow Health Practices Index, the Quetelet Index (wt/ht^2 metric) utilized scores obtained via the Quetelet Index. These were then arranged in categories employed by Segovia, Bartlett, Edwards, and Veitch (1987), the cut- off points of which were derived from the 1959 Metropolitan Life Insurance Tables for height and weight. The three categories (i.e. correct weight, underweight and overweight) used in the scoring of the body mass item are presented in Table 1.

Although there seems to be no specific report as to the reliability of this instrument, it does seem to have considerable validity as the study revealed that good health practices were associated with positive health and that while the health practices measured were not highly intercorrelated, when they were accumulated to form a score

ranging from 0-7, there was an inverse and significant association with good physical health (independent of age, sex, and economic status). Furthermore, health practices were significantly related to mortality rates, independent of intitial physical health status and income level.

See Appendix D for a copy of this instrument.

Norman Health Behaviours Index: This is a nine item scale (Norman, 1985) indexing health behaviours thought to be dependent on an individual's own volition, and which do not correlate significantly with social desirability. Respondents check a numerical category in response to questions about frequency of voluntary medical check-ups, sleeping patterns, eating habits, frequency of physical exercise, alcohol consumption, smoking behaviour, handwashing, feeling stressed or tense, and adequate clothing. An aggregate measure of health behaviour was formed by adding the standard scores for each of the separate behaviours, as the behaviour measures were different. A high score reflects the direction of the more preferred behaviours.

Test-retest reliability (n = 165) of each item was at least .70, with only overeating and eating from each food group showing stability of less than .80.

Convergent validity coefficients (n = 121) were obtained by correlating original test items (excluding checkups) with data from a daily diary (completed three to four weeks later) and were found to be significant at the .001 level. An item estimating the extent of overeating was excluded from the final version of the scale, as there was no evidence to support its validity.

Factor analysis of the intercorrelations between health behaviours in two separate studies (Norman, 1985) suggest that they were largely independent of one another, the average correlations being .09 and .10 (both being insignificant), with smoking and drinking resulting in the highest correlations, r's = .29 and .45.

See Appendix E for a copy of this instrument.

Procedure

Potential subject sources (i.e. the Cabot Institute and individual University instructors) were approached for permission to administer the testing instruments to their students. Potential subjects were informed as to the general purpose of the study and were asked to participate by anonymously completing a package of five questionnaires, as well as providing demographic information (i.e. age, sex, and education level). Subjects were assured that their participation would be voluntary and that they were free to withdraw at any time. At no time did subjects refuse to

participate. They were also informed that payment would be one dollar for each fully completed and returned questionnaire.

Subjects were asked to read each item carefully and to indicate their responses according to the written instructions at the beginning of each questionnaire. They were also cautioned "not to spend too much time" on any one item, and to answer all items.

Completion of the questionnaires required approximately 30 minutes. Therefore, it was arranged that class instructors would distribute the packages and collect them on the following class day, at which time payment occurred. A total of 350 packages was distributed, with 314 being returned; a return rate of 89.7%. None of the returned questionnaires had to be discarded because of missing data. All data was collected within a two month period during the Fall Semester of 1986.

Statistical Analysis

The Pearson Product Moment correlation procedure was employed to determine the degree of relationship among the three composite constructs, and among their components. A factor-analysis was then performed in order to determine whether the relationships among the eight components could be represented parsimoniously.

Results

Overview

Generally, the overall results of this study supported all three hypotheses. Analyses showed that the three personality constructs were indeed correlated with each other, indicating the similarity of their nature. Further substantiating this result were the obtained intercorrelations among the various components of the three constructs, the one exception being the "challenge" component of hardiness. As well, there was evidence to indicate a statistically reliable relationship between the personality constructs and the practice of health behaviours.

The Personality Constructs

The first hypothesis of this study concerned the extent of the relationship among the three composite personality constructs and was analyzed by correlating the overall scores of subjects on the scales measuring hardiness, sense of coherence, and potency. The obtained correlations are presented in Table 2. Note that low scores on the hardiness scale indicate higher levels of hardiness, while high scores on the coherence and potency scales indicate higher levels. Thus, a negative correlation between the hardiness scale and both the coherence and potency scales would be expected if the relationship between them were positive. All

correlations were substantial and in the predicted direction. The correlation between hardiness and potency was -.427 ($p < .001$), between hardiness and coherence -.504 ($p < .001$), and between potency and coherence .598 ($p < .001$).

The Components

The second hypothesis concerned the degree of overlap among the components of the three personality constructs, and was analyzed by examining the twenty-eight possible intercorrelations among the subjects' scores on the various construct components. These intercorrelations are presented in Tables 3a and 3b. Again, it should be noted that low scores on the three hardiness components indicate higher levels of these components, while high scores on the coherence and potency components indicate higher levels. Thus, negative correlations between the components of hardiness and those of coherence and potency would be expected if the relationship between them were positve . Ten of the twelve intercorrelations predicted to be significant, were in the predicted direction, substantial in size, and statistically significant. The fact that the remaining two intercorrelations were not significant may be due to chance, however, this could be addressed in future research. The probability of obtaining 10 out of 12 expected correlations by chance is less than .001. Not only were the predictions satisfied, but many of the other relationships were of equal or greater magnitude. Only the

hardiness component "challenge" did not highly correlate with any of the other seven components.

The number and magnitude of the intercorrelations among the eight components of the three personality constructs, led to a second-order principal components factor analysis, followed by a varimax rotation. The Kaiser-Meyer-Olkin measure of sampling adequacy was .84639 and the Bartlett Test of Sphericity was 909.90098 ($p < .0001$) thereby establishing the legitimacy of the factor analytic procedure in this case (Norusis, 1985, p.128-129). The standard criterion of .40 was used as a cut-off factor loading. The factor analysis yielded two factors with Eigenvalues greater than 1. These can be seen in Table 4. The first factor emerged as a large composite factor and accounted for 48.9% of the total variance. It consisted of hardiness (commitment and control), coherence (manageability, meaningfulness, and comprehensibility), and potency (mastery and commitment). The second factor emerged as the single component challenge, from the hardiness measure, and accounted for 13.2% of the total variance. Together these two factors accounted for well over half (62.1%) of the total variance.

The Personality Constructs and Health Behaviours

The third hypothesis of this study concerned the relationship between the personality constructs and health behaviours and was analyzed by correlating the overall scores of subjects on the scales measuring the three

composite constructs and their scores on the two scales measuring health protective behaviour.

The relationship among each of the three personality scales and the two health behaviour indices were in the direction predicted and all were statistically reliable. They are presented in Table 5. As can be seen, the correlations between the Norman Index and the personality constructs were generally stronger than those between the Berkman and Breslow Index and the personality constructs. These differences in strength are significant at the level of .01 for hardiness, .01 for sense of coherence, and .05 for potency (see Table 5).

Because of the two-factor structure produced by the factor analysis, it was also decided to correlate scores on each of the factors with scores on each of the health behaviour indices. Factor scores were obtained by summing the standard scores for the seven components comprising Factor 1 and the challenge component which corresponded to Factor 2. There was a relationship between Factor Score 1 and the Norman Index ($r = .274$; $p < .001$), but not between Factor Score 1 and the Berkman and Beslow Index. Challenge (Factor Score 2) was not related with either of the health behaviour indices. These results are presented in Table 6.

Health Behaviours

While it was not the intention of this study to examine the intracacies of the two health behaviour indices, an analysis of the relationship between the Norman Index and the Berkman and Breslow Index was performed. The correlation between these two indices was .423 ($p < .001$).

Discussion

The Personality Constructs and Their Components

The overall results of this study appear to strongly support the argument presented in the introduction, that is that there is a great similarity between and among the three composite personality constructs of hardiness, sense of coherence, and potency, and between their respective components. In fact, the obtained correlations suggest that the three purportedly different constructs represent or are measuring the same entity. This finding is further substantiated by the results of a factor analysis which indicated that 7 of the 8 components actually load on only one factor. If the personality constructs of hardiness, coherence, and potency were independent as suggested by their authors (Kobasa, Antonovsky, and Ben-Sira, respectively), three factors should have emerged, with the components of each construct loading on the separate factors. This, however, was not the case.

It is entirely possible then, that what has been described as three different personality constructs, is actually only one personality dimension. Furthermore, that the seven components loaded on this one factor are all aspects of this unitary personality construct. Given the magnitude of the relationships among these seven components, it is also possible that there may actually be fewer than seven components.

This notion of a unitary personality construct (comprised of various aspects, or components) makes conceptual sense, particularly in its role within the stress-illness relationship. People possessing such a personality dimension (or some degree of it) probably would be less adversely affected by stressful events, than those who don't possess it, and as Kobasa, Antonovsky, and Ben-Sira postulated, repeated experiences in which this unitary personality dimension is successfully utilized would likely serve to enhance people's perception of their own capabilities and strengths.

Bandura's (1981) concept of self-efficacy (the perceived ability to cope with specific situations) seems relevant in that it appears to encompass just such a constellation of personality components. As well, one's percept of self efficacy is accorded a very widespread influence, including actions, motivaton, thought patterns, and emotional reactions. Bandura, however, viewed self-efficacy as "particularized", varying across "activities and situational circumstances", rather than as a "global disposition" that can be measured by comprehensive personality inventories (1981, p. 124). It is my opinion that the concept of self-efficacy, if expanded to account for the accumulation of previous learning experiences (successes and failures) that together form one's general orientation or approach to life situations, would be more appropriate. Such a unitary, yet comprehensive, personality

construct might be more aptly labeled as a "generalized efficacy".

Enough anecdotal and research evidence exists to firmly establish personality as a resistance resource or buffer in the stress-illness relationship, however, the number of personality constructs theorized, and their similarity illustrates the need for a more integrated approach. While the need for replication is recognized, the existence of only one, unitary personality construct namely generalized efficacy, as indicated by the results of this study, has important implications for researchers in this field. It offers a certain theoretical and practical ease. Further research is, of course, necessary to clarify the nature of this generalized efficacy construct, in terms of how and where it operates in the stress-illness relationship, and how it might be related to other existing resistance resources.

As well, the development of an appropriate measure of generalized efficacy is necessary. While Kobasa, Antonovsky, and Ben-Sira don't actually specify particular situations which might be considered stress-provoking, the test items purported to measure hardiness, coherence, and potency appear to deal mostly with people's responses to stress-related events where decisions and actions are possible. For example, the apparent independence of the challenge component is not surprising as the items used to measure it appear to be measuring belief in a socialistic

society, rather than the qualities described by Kobasa in her definition of challenge as a component of the hardiness construct. However, there are a wide variety of stressful life events; stress is also associated with events beyond one's control. If this is the case, then it is possible also that the personality traits being tapped by such questions are not a sufficient constellation to describe the stress-resistant individual. One method by which it might be possible to tap all of these personality characteristics would be to construct a test in the nature of the Minnesota Multiphasic Personality Inventory (Phares, 1984, p.648). Such a large group of questions which would distinguish between those who have become ill in association with stressful events and those who have not become ill under similar stressful events could lead to identification of the actual traits involved.

The Personality Constructs and Health Protective Behaviour

It was argued earlier in this paper that because of the "active" approach that seems to be a common theme of the three personality constructs and because of their pervasive nature, it might also be possible that the presence of these personality dimensions could be related to the practice of health behaviours, so that people who possess such characteristics as hardiness, coherence, or potency might also be more likely to engage in health protective behaviours to a greater extent than people not possessing

them. This hypothesis was also supported.

The overall results regarding the nature of the relationship between the personality constructs and the practice of health behaviours, while not entirely consistent, are in keeping with those of other researchers (Weibe and McCallum, 1986; Hannah, 1988). Kobasa, Maddi, and Puccetti (1982) provide evidence that hardiness is independent of exercise, a specific behaviour touted as being health protective. As well, Norman (1986) found that there was no evidence to suggest any relationship between health locus of control (which is in turn a subscale of the control component of the hardiness construct) and frequency of health behaviours. One possible and plausible explanation for the somewhat low correlations among the three personality constructs and the practice of health behaviours could be moderating variables such as age and health concern, as suggested by Hannah (1988). As well, the traits measured by those three constructs do not seem to be adequately selected for stress-handling competence, and improving those tests (or the development of a new one) may show a closer relationship to the practice of health protective behaviours after all.

With regards to the relationship between the two health behhaviour indices, there was fairly strong evidence for the existence of such a relationship ($r = .423$; $p < .001$), however it was not as high as might be expected. The Berkman and Breslow Index is scored dichotomously, while the

Norman Index is scored in a continuous fashion. It is possible that the different test designs, the very different scoring procedures, as well as the difference in the number of behaviours tapped by the two indices, could account for the finding that they were not more highly related. It is also possible that these same reasons may be responsible for the finding that Factor 1 was significantly related to the Norman Index but not to that of Berkman and Breslow.

Summary and Conclusions

The three personality constructs of hardiness, coherence, and potency have each been described by their authors as personality dimensions which intervene in the stress-illness relationship. People who possess greater degrees of these personality dimensions are thought to be less adversely affected by stressful events than those lower in these dimensions. This is presumably because their perceptions of the stressful events are altered so that dealing with such events is challenging and worthy of the investment of energy. As a result, their perceptions of their own capacities to deal with the event are also enhanced. This study hypothesized that the three composite personality constructs were essentially the same or very similar in nature; that there would be a substantial positive relationship between them. The intercorrelations among the three constructs support this contention. As well, analyses of the eight components comprising the three composite constructs offer further evidence for the proposed similarity. These show a substantial degree of overlap and factor analytic evidence indicates that the three composite constructs can be defined by two factors: a large combination factor representing seven of the eight components, and a simple factor representing the single component "challenge." The general findings indicate the possibility of only one, unitary composite personality construct, as opposed to the separate but similar composite

personality constructs proposed by Kobasa, Antonovsky, and Ben-Sira. The term "generalized efficacy" is suggested as being a suitable name for such a unitary composite personality construct.

The generally "active" approach encompassed within each of the three composite personality constructs can be considered conducive to the practice of health protective behaviours. People who possess greater degrees of hardiness, coherence, and/or potency might be expected to engage in more health protective behaviours, than those who don't. Therefore, this study also proposed a substantial positive relationship between the three composite personality constructs and the frequency of health protective behaviours. This relationship, while supported, was not strong. It is possible that the proposed relationship is moderated by other variables such as health concern, as suggested by Hannah (1988). Also, the portrayal of stress as being a matter of choice (whether one deals with it, or not) only taps part of life's stressful events. It is my view that those outside that decision-making process have to be included in any adequate description of illness-producing stress, and therefore may incorporate different personality characteristics for the individual.

The future investigation of a unitary personality construct (as alluded to earlier) and possible moderating variables between such a personality dimension and health behaviours would appear to be worthwhile.

Tables

Table 1

Weight Categories for Body Mass Comparison

	Quetelets	
	Males	Females
Correct Weight	19.638 - 24.815	19.121 - 24.559
Underweight	< 19.638	< 19.121
Overweight	> 24.815	> 24.559

Table 2

Correlations Between Personality Constructs (N=314)

Construct	Hardiness	Coherence	Potency
1. Hardiness	1.000	-.504*	-.427*
2. Coherence		1.000	.598*
3. Potency			1.000

* $p < .001$

Table 3a

Intercorrelations Between Components (N = 314)

Component	1	2	3	4
1. Control	1.000			
2. Commitment	.554**	1.000		
3. Challenge	.159*	.130*	1.000	
4. Manageability	(-.561)**	-.318**	-.022	1.000
5. Meaningfulness	-.544**	(-.438)**	(-.018)	.664**
6.Comprehensibility	(-.514)**	-.337**	(-.112)*	.650**
7. Mastery	(-.437)**	-.410**	-.002	(-.547)**
8. Commitment	-.506**	(-.386)**	(-.041)	.430**

Note. Predicted intercorrelations are in parentheses.

* $p \leq .01$ ** $p < .001$

Table 3b

Intercorrelations Between Components (N = 314).

Component	5	6	7	8
1. Control				
2. Commitment				
3. Challenge				
4. Manageability				
5. Meaningfulness	1.000			
6. Comprehensibility	.508**	1.000		
7. Mastery	.494**	(.418)**	1.000	
8. Commitment	(.430)**	(.401)**	.541**	1.000

Note. Predicted intercorrelations are in parentheses.

* p <.01 **p <.005

Table 4

The Eight Components and Their Associated Factor Loadings

Component	Factor 1	Factor 2
1. Manageability	.82625	
2. Meaningfulness	.79781	
3. Control	-.76229	
4. Mastery	.75069	
5. Comprehensibility	.73147	
6. Commitment (Potency)	.70083	
7. Commitment (Hardiness)	-.60557	
8. Challenge		.94640
Eigenvalue	3.91120	1.05588
% of variance accounted for	48.9	13.2
Cummulative % of variance accounted for	48.9	62.1

Table 5

Correlations Between the Personality and Health Behaviour Indices

Construct	Health Behaviour Index		Significance Level of Difference
	Norman	Berkman and Breslow	
Hardiness	-.316**	-.050	.01
Coherence	.396**	.111*	.01
Potency	.278**	.125*	.05

Note. Significant difference between indices determined by Fisher's z_r transformation.

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

Table 6

Correlations Between Factors and Health Behaviour Indices.

Health Behaviour Index	Factor Score 1	Factor Score 2
Norman	.274*	-.055
Berkman and Breslow	.082	-.011

* $p < .001$

References

Alterkruse, E.G., and Wilmore, J.H. (1973). Changes in blood chemistries following a controlled exercise program. Journal of Occupational Medicine, 15, 110-113.

Antonovsky, A. (1968). Social class and the major cardiovascular diseases. Journal of Chronic Diseases, 21, 65-106.

Antonovsky, A. (1979). Health, Stress, and Coping. San Francisco: Jossey-Boss.

Antonovsky, A. (1983). The sense of coherence: Development of a research instrument. Newsletter and Research Reports, 1, 1-22. W.S. Schwartz Research Centre for Behavioural Medicine, Tel Aviv University.

Antonovsky, A. (1984). The sense of coherence as a determinant of health. In J.D. Matarazzo, S.M. Weiss, J.A. Herd, and N.E. Miller (Eds.), Behavioural Health: A Handbook of Health Enhancement and Disease Prevention (pp. 114- 129). New York: John Wiley and Sons, Inc.

Averill, J.R. (1973). Personal control over aversive stimuli and its relationship to stress. Psychological Bulletin, 80, 286-303.

Bandura, A. (1977). Toward a unifying theory of behavioural change. Psychological Review, 84, 191-215.

Bandura,A. (1981)? Self-efficacy mechanism in human agency. American Psychologist, 37 (2), 122-147.

Belloc, N.B., and Breslow, L. (1972). Relationship of physical health status and health practice. Preventive Medicine, 1, 409-421.

Ben-Sira, Z. (1985). Potency: A stress-buffering link in the coping-stress-disease relationship. Social Science in Medicine, 21 (4), 397-406.

Berkman, L.F., and Breslow, L. (1983). Health and Ways of Living. New york: Oxford University Press, Inc.

Bieliauskas, L.A. (1982). Stress and its Relationship to Health and Illness. Boulder, Colorado: Westview Press, Inc.

Carter, H., and Glick, P.C. (1970). Marriage and divorce: A Social and Economic Study. Cambridge, Mass.: Howard University Press.

Cobb, S. (1976). Social support as a moderator of life stress. Psychosomatic Medicine, 3, 300-314.

Dohrenwend, B.S., and Dohrenwend, B.P. (Eds.). (1974). Stressful Life Events: Their Nature and Effects. New York: Wiley.

Gunderson, E., and Rahe, R. (Eds). (1974). Life Stress and Illness. Springfield, Ill.: Charles C. Thomas.

Hahn, M.E. (1966). California Life Goals Evaluation Schedule. Palo Alto: Western Psychological Services.

Hannah, T.E. (1987). Health behaviour: The role of health as a Personal Life Concern. Canadian Journal of Public Health, (in press).

Hannah, T.E. (1988). Hardiness and health behaviour: The role of health concern as a moderator variable. Journal of Human Stress, (in press).

Holahan, C.J. and Moos, R.H. (1985). Life stress and health: Personality, coping, and family support in stress resistance. Journal of Personality and Social Psychology, 49 (3), 739-747.

Kasl, S.A., and Cobb, S. (1966). Health behaviour, illness behaviour, and sick-role behaviour. Archives of Environmental Health, 12, 246-266.

Katz, D., and Kahn, R.L. (1978). The Social Psychology of Organizations (2nd ed.). New York: Wiley.

Kobasa, S.C. (1979). Stressful life events, personality, and health: An inquiry into hardiness. Journal of Personality and Social Psychology, 37, 1-11.

Kobasa, S.C. (1982). The hardy personality: Toward a social psychology of stress and health. In G.S. Sanders and J. Suls (Eds.), Social Psychology of Health and Illness (pp. 3-32). Hillsdale, New Jersey: Lawrence Erlbaum Associates.

Kobasa, S.C. (1982). Hardiness Measurement. Unpublished manuscript.

Kobasa, S.C., Maddi, S.R., and Courington, S. (1981). Personality and constitution as mediators in the stress-illness relationship. Journal of Health and Social Behaviour, 22, 368-378.

Kobasa, S.C., Maddi, S.R., and Kahn, S. (1982). Hardiness and health: A prospective study. Journal of Personality and Social Psychology, 42 (1), 168-177.

Kobasa, S.C., Maddi, S.R., and Puccetti, M.C. (1982). Personality and exercise as buffers in the stress- illness relationship. Journal of Behavioural Medicine, 5, 391-404.

Krause, N., and Stryker, S. (1984). Stress and well- being: The buffering role of locus of control beliefs. Social Science in Medicine, 18 (9), 783-790.

Lazarus, R.S., and Cohen, J.B. (1977). Environmental stress. In J. Altman and J.F. Wohlwill (Eds.), Human behaviour and the environment: Current theory and research. New York: Plenum Press.

Lazarus, R.S. (1966). Psychological Stress and the Coping Process. New York: McGraw-Hill.

Lefcourt, H.M. (1976). Locus of Control: Current Trends in Theory and Research. Hillsdale, New Jersey: Lawrence Erlbaum Associates.

Leventhal, H., and Hirschman, R.S. (1982). In G.S. Sanders and J. Suls (Eds.), Social Psychology of Health and Illness. Hillsdale, New Jersey: Lawrence Erlbaum Associates.

Luborsky, L., Todd, T.C., and Katchen, A.H. (1973). A self-administered social assets scale for predicting physical and psychological illness and health. Journal of Psychosomatic Research, 17, 109-120.

Maddi, S.R., Kobasa, S.C., and Hoover, M. (1979, Fall). An alienation test. Journal of Humanistic Psychology, 19, (4), 73-6.

McCaul, K.D., Solomon, S., and Holmes, D.S. (1979). Effects of paced respiration and expectations on physiological and psychological responses to threat. Journal of Personality and Social Psychology.

Metropolitan Life Insurance Company (Nov. - Dec., 1959). New weight standards for men and women. Statistical Bulletin. 40, 1-10.

Mischel, W. (1973). Towards a cognitive social learning reconceptualization of personality. Psychological Review, 80, 252-283. Myers, J., Lindenthal, J.J., and Pepper, M.P. (1975). Life events, social integration and psychiatric symptomatology. Journal of Health and Social Behaviour, 16, 121-127

Norman, R.M.G. (unpublished manuscript). Health locus of control: Perceived health benefits of behaviour and frequency of health behaviours. Health Psychology.

Norman, R.M.G. (1985). Studies of the interrelationships amongst health behaviours. Canadian Journal of Public Health, 76 (6), 407-410.

Norusis, M.J. (1985). SPSS-X Advanced Statistics Guide. New York: McGraw-Hill.

Oettgen, H.F. (1977). Immunotherapy of cancer. New England Journal of Medicine, 297, 434-81.

Pearlin, L.I., and Schooler, C. (1978). The structure of coping. Journal of Health and Social Behaviour, 19, 2-21.

Phares, E.J. (1976). Locus of Control in Personality. Morristown, New Jersey: General Learning Press.

Phares, E.J. (1984). Introduction to Personality. Columbus, Ohio: Charles E. Merrill Publishing Company.

Rabkin, J.G., and Struening, E.L. (1976, December 3). Life events, stress, and illness. Science, 194, 1013- 1020.

Rotter, J.B. (1966). Generalized expectancies for internal versus external control of reinforcements. Psychological Monograms, 80 (609), 1.

Rotter, J.B., Seeman, M., and Liverant, S. (1962). Internal vs. external locus of control of reinforcement: A major variable in behaviour theory. In N.F. Washburne (Ed.), Decisions, Values and Groups. New York: Pergamon Press.

Scheier, M.F., and Carver, C.S. (1985). Optimism, coping, and health: Assessment and implications of generalized outcome expectancies. Health Psychology, 4 (3), 219-247.

Seeman, M. (1959). On the meaning of alienation. American Sociological Review, 24, 783-791.

Seeman, M. (1972). Alienation and engagement. In A. Campbell, and P.E. Converse (Eds.), The Human Meaning of Social Change (pp. 467-527). New York: Russel Sage.

Seeman, M., and Seeman, T.E. (1983, June). Health behaviour and personal autonomy: A longitudinal study of the sense of control in illness. Journal of Health and Social Behaviour, 24, 144-160.

Segovia, J., Bartlett, R., Edwards, A., and Veitch, B. (1987). Lifestyle, Health Practices and Utilization of Health Services: Final Report. Memorial University of Newfoundland Faculty of Medicine: Division of Community Medicine and Behavioural Sciences.

Seligman, M.E.P. (1975). Helplessness. San Francisco: Freeman.

Selye, H. (1956). The Stress of Life. New York: McGraw- Hill.

SPSS Inc. (1983). SPSS-X User's Guide. New York: McGraw-Hill.

Srole, L. (1956). Social integration and certain corollaries: An exploratory study. American Sociological Review, 21, 709-716.

Weibe, D.J. and McCallum, D.M. (1986). Health practices and hardiness as mediators in the stress-ilness relationship. Health Psychology, 5 (5), 425-438.

Weiss, J.M. (1971). Effects of coping behaviour in different warning signal conditions on stress pathology in rats. Journal of Comparative and Physiological Psychology, 77, 1-13.

White, R.W. (1959). Motivations reconsidered: The concept of competence. Psychological Review, 66, 297-333.

Wilcox, B.L. (1981). Social support, life stress, and psychological adjustment: A test of the buffering hypothesis. American Journal of Community Psychology, 9 (4), 371-386.

Appendix A

Hardiness Scale

Part A

The items below consist of attitudes with which you may or may not agree. As you will see, many of the items are worded very strongly. This is so you can decide the DEGREE to which you agree or disagree. Please indicate your answer by circling the choice which best expresses your view.

Please read the items carefully. Be sure to answer all on the basis of the way you feel now. Don't spend too much time on any one item.

1. I wonder why I work at all.

0	1	2	3
not at all true	a little true	quite true	completely true

2. Most of life is wasted on meaningless activity

0	1	2	3
not at all true	a little true	quite true	completely true

3. If you have to work, you might as well choose a career where you deal with matters of life and death.

0	1	2	3
not at all true	a little true	quite true	completely true

4. I find it difficult to imagine enthusiasm concerning work.

0	1	2	3
not at all true	a little true	quite true	completely true

5. It doesn't matter if people work hard at their jobs; only a few bosses profit.

0	1	2	3
not at all true	a little true	quite true	completely true

6. Ordinary work is too boring to be worth doing.

0	1	2	3
not at all true	a little true	quite true	completely true

7. I don't like my job or enjoy my work; I just put in my time to get paid.

0	1	2	3
not at all true	a little true.	quite true	completely true

8. I find it hard to believe people who actually feel that the work they perform is of value to society.

0	1	2	3
not at all true	a little true	quite true	completely true

9. If a job is dangerous, that makes it all the better.

0	1	2	3
not at all true	a little true	quite true	completely true

10. The human's fabled ability to think is not really such an advantage.

0	1	2	3
not at all true	a little true	quite true	completely true

11. The attempt to know yourself is a waste of effort.

0	1	2	3
not at all true	a little true	quite true	completely true

12. I am really interested in the possibility of expanding my consciousness through drugs.

0	1	2	3
not at all true	a little true	quite true	completely true

13. Life is empty and has no meaning in it for me.

0	1	2	3
not at all true	a little true	quite true	completely true

14. The belief in individuality is only justifiable to impress others.

0	1	2	3
not at all true	a little true	quite true	completely true

15. I wish I could be carried away by a revelation, as apparently happened to some historically important persons.

0	1	2	3
not at all true	a little true	quite true	completely true

16. I long for a simple life in which body needs are the most important things and decisions don't have to be made.

0	1	2	3
not at all true	a little true	quite true	completely true

17. Unfortunately, people don't seem to know that they are only creatures after all.

0	1	2	3
not at all true	a little true	quite true	completely true

18. The most exciting thing for me is my own fantasies.

0	1	2	3
not at all true	a little true	quite true	completely true

19. The more able person has a greater responsibility for the welfare of the less able.

0	1	2	3
not at all true	a little true	quite true	completely true

20. Public supported medical care is the right of everyone.

0	1	2	3
not at all true	a little true	quite true	completely true

21. Violence never is justified because it harms the doer and the receiver.

0	1	2	3
not at all true	a little true	quite true	completely true

22. The young owe the old complete economic security.

0	1	2	3
not at all true	a little true	quite true	completely true

23. From each according to his ability; to each according to his need.

0	1	2	3
not at all true	a little true	quite true	completely true

24. A retired person should be free of all taxes.

0	1	2	3
not at all true	a little true	quite true	completely true

25. Ownership of property beyond providing for one's modest comfort and security should be illegal.

0	1	2	3
not at all true	a little true	quite true	completely true

26. Government should guarantee jobs for all.

0	1	2	3
not at all true	a little true	quite true	completely true

27. To achieve freedom from want is a large enough goal for anyone.

0	1	2	3
not at all true	a little true	quite true	completely true

28. One who does one's best should expect to receive complete economic support from one's society.

0	1	2	3
not at all true	a little true	quite true	completely true

29. New laws should not be passed if they damage one's income.

0	1	2	3
not at all true	a little true	quite true	completely true

30. There are no conditions which justify endangering the health, food, and shelter of one's family or of one's self.

0	1	2	3
not at all true	a little true	quite true	completely true

31. Wealth and fame are less important than knowing one has an assured minimal social security.

0	1	2	3
not at all true	a little true	quite true	completely true

32. Pensions large enough to provide for dignified living are the right of all when age or illness prevents one from working.

0	1	2	3
not at all true	a little true	quite true	completely true

33. Steady saving is the best road to economic security.

0	1	2	3
not at all true	a little true	quite true	completely true

34. Politicians control our lives.

0	1	2	3
not at all true	a little true	quite true	completely true

35. Most of my activities are determined by what society demands.

0	1	2	3
not at all true	a little true	quite true	completely true

36. There are only certain strict paths to follow if one is to be successful in our society.

0	1	2	3
not at all true	a little true	quite true	completely true

37. Everyone is out to manipulate you toward his own ends.

0	1	2	3
not at all true	a little true	quite true	completely true

38. Often when I interact with others, I feel insecure over the outcome.

0	1	2	3
not at all true	a little true	quite true	completely true

39. I try to avoid close relationships with people so that I will not be obligated to them.

0	1	2	3
not at all true	a little true	quite true	completely true

40. Those who work for a living are manipulated by the bosses.

0	1	2	3
not at all true	a little true	quite true	completely true

41. No matter how hard you work, you never really seem to reach your goals.

0	1	2	3
not at all true	a little true	quite true	completely true

42. I feel no need to try my best at work, for it makes no difference anyway.

0	1	2	3
not at all true	a little true	quite true	completely true

43. When you marry and have children you have lost your freedom of choice.

0	1	2	3
not at all true	a little true	quite true	completely true

44. My parents imposed their wishes and standards on me too much.

0	1	2	3
not at all true	a little true	quite true	completely true

45. I am not sure I want to stay married because I don't want to feel tied down.

0	1	2	3
not at all true	a little true	quite true	completely true

46. Thinking of yourself as a free person leads to great frustration and difficulty.

0	1	2	3
not at all true	a little true	quite true	completely true

47. No matter how hard I try, my efforts will accomplish nothing.

0	1	2	3
not at all true	a little true	quite true	completely true

48. Often I do not really know my own mind.

0	1	2	3
not at all true	a little true	quite true	completely true

Hardiness: Committment items: 1-18
Challenge items: 19-33
Control items: 34-48

Part B

By circling the letter "a" or "b", please indicate which of the two statements provided in each item listed below BETTER represents your attitude.

1. a. Many of the unhappy things in people's lives are partly due to bad luck.
   b. People's misfortunes result from the mistakes they make.

2. a. One of the major reasons why we have wars is because people don't take enough interest in politics.
   b. There will always be wars, no matter how hard people try to prevent them.

3. a. In the long run, people get the respect they deserve in this world.
   b. Unfortunately, an individual's work often passes unrecognized no matter how hard he tries.

4. a. The idea that most teachers are unfair to students is nonsense.
   b. Most students don't realize the extent to which their grades are influenced by accidental happenings.

5. a. Without the right breaks one cannot be an effective leader.
   b. Capable people who fail to become leaders have not taken advantage of their opportunities.

6. a. No matter how hard you try some people just don't like you.
   b. People who can't get others to like them don't understand how to get along with others.

7. a. I have often found that what is going to happen will happen.
   b. Trusting to fate has never turned out as well for me as making a decision to take a definite course of action.

8. a. In the case of the well prepared student there is rarely if ever such a thing as an unfair test.
   b. Many times exam questions tend to be so unrelated to course work that studying is really useless.

9. a. Becoming a success is a matter of hard work, luck has little or nothing to do with it.
   right place at the right time.

b. Getting a good job depends mainly on being inthe right place at the right time.

10. a. The average citizen can have an influence in government decisions.
    b. This world is run by the few people in power, and there is not much the little guy can do about it.

11. a. When I make plans I am almost certain that I can make them work.
    b. It is not always wise to plan too far ahead because many things turn out to be a matter of good and bad fortune anyway.

12. a. In my case getting what I want has little or nothing to do with luck.
    b. Many times we might just as well decide what to do by flipping a coin.

13. a. Who gets to be the boss often depends on who was lucky enough to be in the right place first.
    b. Getting people to do the right thing depends upon ability; luck has little to do with it.

14. a. As far as world affairs are concerned, most of us are the victims of forces we can neither understand nor control.
    b. By taking an active part in political and social affairs the people can control world events.

15. a. Most people don't realize the extent to which their lives are controlled by accidental happenings.
    b. There is really no such thing as "luck".

16. a. It is hard to know whether or not a person really likes you.
    b. How many friends you have depends on how nice a person you are.

17. a. In the long run the bad things that happen to us are balanced by the good ones.
    b. Most misfortunes are the result of lack of ability, ignorance, laziness, or all three.

18. a. With enough effort we can wipe out political corruption.
    b. It is difficult for people to have control over things politicians do in office.

19. a. Sometimes I can't understand how supervisors arrive at work evaluations.

b. There is a direct connection between how hard I work and the evaluations I get.

20. a. Many times I feel that I have little influence over the things that happen to me.
b. it is impossible for me to believe that chance or luck plays an important role in my life.

21. a. People are lonely because they don't try to be friendly.
b. There's not much use in trying too hard to please people, if they like you, they like you.

22. a. What happens to me is my own doing.
b. Sometimes I feel that I don't have enough control over the direction my life is taking.

23. a. Most of the time I can't understand why politicians behave the way they do.
b. In the long run the people are responsible for bad government on a national as well as on a local basis.

Hardiness: Control items: 1-23

Appendix B

Sense of Coherence Scale

Here is a series of questions relating to various aspects of our lives. Please indicate your answer to each item by circling the number which best expresses your feeling. Please give only one answer to each question.

1. When you talk to people, do you have the feeling that they don't understand you?

1	2	3	4	5	6	7
never have this feeling						always have this feeling

2. In the past, when you had to do something which depended upon cooperation with others, did you have the feeling that it:

1	2	3	4	5	6	7
surely wouldn't get done						surely would get done

3. Think of the people with whom you come into contact daily, aside from the ones to whom you feel closest. How well do you know most of them?

1	2	3	4	5	6	7
you feel that they're strangers						you know them very well

4. Do you have the feeling that you don't really care about what goes on around you?

1	2	3	4	5	6	7
very seldom or never						very often

5. Has it happened in the past that you were surprised by the behavior of people whom you thought you knew well?

1	2	3	4	5	6	7
never happened						always happened

6. Has it happened that people whom you counted on disappointed you?

1	2	3	4	5	6	7
never happened						always happened

7. Life is:

1	2	3	4	5	6	7
full of interest						completely routine

8. Until now your life has had:

1	2	3	4	5	6	7
no clear goals or purpose at all						very clear goals and purpose

9. Do you have the feeling that you're being treated unfairly?

1	2	3	4	5	6	7
very often						very seldom or never.

10. In the past ten years your life has been:

1	2	3	4	5	6	7
full of changes without your knowing what will happen next						completely consistent and clear

11. Most of the things you do in the future will probably be:

1	2	3	4	5	6	7
completely fascinating						deadly boring

12. Do you have the feeling that you are in an unfamiliar situation and don't know what to do?

1	2	3	4	5	6	7
very often						very seldom or never

13. What best describes how you see life:

1	2	3	4	5	6	7
one can always find a solution to painful painful things in life						there is no solution to things in life

14. When you think about your life, you very often:

1	2	3	4	5	6	7
feel how good it is to be alive						ask yourself why you exist at all

15. When you face a difficult problem, the choice of a solution is:

1	2	3	4	5	6	7
always confusing and hard to find						always completely clear

16. Doing the things you do every day is:

1	2	3	4	5	6	7
a source of deep pleasure and satisfaction						a source of pain and boredom

17. Your life in the future will probably be:

1	2	3	4	5	6	7
full of changes without your knowing what will happen next						completely consistent and clear

18. When something unpleasant happened in the past your tendency was:

1	2	3	4	5	6	7
"to eat yourself up" about it						to say "ok, that's that, I have to live with it" and go on

19. Do you have very mixed-up feelings and ideas?

1	2	3	4	5	6	7
very often						very seldom or never

20. When you do something that gives you a good feeling:

1	2	3	4	5	6	7
it's certain that you'll go on feeling good						it's certain that something will happen to spoil the feeling

21. Does it happen that you have feelings inside you would rather not feel?

1	2	3	4	5	6	7
very often						very seldom or never

22. You anticipate that your personal life in the future will be:

1	2	3	4	5	6	7
totally without meaning or purpose						full of meaning and purpose

23. Do you think that there will <u>always</u> be people whom you'll be able to count on in the future?

1	2	3	4	5	6	7
you're certain there will be						you doubt there will be

24. Does it happen that you have the feeling that you don't know exactly what's about to happen?

1	2	3	4	5	6	7
very often						very seldom or never

25. Many people - even those with a strong character - sometimes feel like sad sacks. Have you felt this way in the past?

1	2	3	4	5	6	7
never						very often

26. When something happened, have you generally found that:

1	2	3	4	5	6	7
you overestimated or underestimated its importance						you saw things in the right proportion

27. When you think of difficulties you are likely to face in the important aspects of your life, do you have the feeling that:

1	2	3	4	5	6	7
you will always succeed in overcoming the difficulties						you won't succeed in overcoming the difficulties

28. Do you have the feeling that there's little meaning in the things you do in your daily life?

1	2	3	4	5	6	7
very often						very seldom or never

29. How often do you have feelings that you're not sure you can keep under control?

1	2	3	4	5	6	7
very often						very seldom or never

Coherence: Comprensibility items: 1,3,5,10,12,15,17,19,21,24,26
Manageability items: 2,6,9,13,18,20,23,25,27,29
Meaningfulness items: 4,7,8,11,14,16,22,28

Appendix C

Potency Scale

Please indicate the extent to which you agree or disagree by circling the appropriate choice:

1. I have little control over things that happen to me.

1	2	3	4	5	6
very much agree					very much disagree

2. I feel that I am being pushed around in life.

1	2	3	4	5	6
very much agree					very much disagree

3. I can do about anything I set my mind to.

1 2 3 4 5 6

4. I often feel helpless in dealing with the problems of life.

1 2 3 4 5 6

5. What happens to me in the future mostly depends upon me.

1 2 3 4 5 6

6. There is really no way I can solve some of the problems I have.

1 2 3 4 5 6

7. I certainly feel useless at times.

1 2 3 4 5 6

8. All in all I am inclined to feel that I am a failure.

1 2 3 4 5 6

9. I am able to do things as well as most other people.

1 2 3 4 5 6

10. Nowadays a person has to live pretty much for today and let tomorrow take care of itself.

1 2 3 4 5 6
very much agree — very much disagree

11. In spite of what some people say, the lot of the average man is getting worse and not better.

1 2 3 4 5 6

12. It is hardly fair to bring children into the world with the way things look for the future.

1 2 3 4 5 6

13. Party membership is more important than talent for achieving something in this society.

1 2 3 4 5 6

14. Having the right connections is more important than talent for achieving something.

1 2 3 4 5 6

15. Community leaders are indifferent to one's needs.

1 2 3 4 5 6

16. Little can be accomplished in this society which is basically unpredictable and lacking order.

1 2 3 4 5 6

17. Life goals are receding rather than being realized.

1 2 3 4 5 6

18. Life is futile.

1 2 3 4 5 6

19. Nowadays one cannot count even on closest personal associations for support.

1 2 3 4 5 6

Potency: **Mastery items:** 1-9
Committment items: 10-19

Appendix D

Health Practices Index (Berkman and Breslow)

1. How often do you engage in each of the following leisure-time activities? Indicate your answer for each item by checking ( ) one of the three choices.

(a)	swimming/ walking	____ never	____ sometimes	____ often
(b)	physical exercise	____ never	____ sometimes	____ often
(c)	sports	____ never	____ sometimes	____ often
(d)	gardening	____ never	____ sometimes	____ often
(e)	fishing/ hunting	____ never	____ sometimes	____ often

2. How often do you smoke cigarettes? Indicate your answer by checking ( ) the appropriate choice(s).

____ (a) I have smoked in the past, and I still do.
____ (b) I have smoked in the past, but no longer do so.
____ (c) I have never smoked.

3. Please indicate your height and weight (to the best of your knowledge).

(a) height = _____ (inches)
(b) weight = _____ (pounds)

4. How often do you drink the following types of alcohol? Indicate your answer by checking ( ) one of the four choices.

(a) wine ____ never ____ less than once a week
____ once or twice a week ____ more than twice a week

(b) beer ____ never ____ less than once a week
____ once or twice a week ____ more than twice a week

(c) liquor ____ never ____ less than once a week
____ once or twice a week ____ more than twice a week

5. When you drink wine, beer, or liquor, how many drinks do you usually have at a sitting? Indicate your answer by checking ( ) one of the four choices.

(a)	wine	____ never	____ 1 or 2 drinks	
		____ 3 or 4 drinks	____ 5 plus drinks	
(b)	beer	____ never	____ 1 or 2 drinks	
		____ 3 or 4 drinks	____ 5 plus drinks	
(c)	liquor	____ never	____ 1 or 2 drinks	
		____ 3 or 4 drinks	____ 5 plus drinks	

6. How many hours of sleep do you usually get a night? Indicate your answer checking ( ) one of the choices.

(a) 6 hours or less ____
(b) 7 hours ____
(c) 8 hours ____
(d) 9 hours or more ____

Appendix E

Health Practices Scale (Norman)

For each of the following questions, please circle the answer which best reflects your behaviour.

1. How many times during the past four years have you gone for a medical checkup while feeling healthy?

0 Checkup in past 4 years	1 Checkup in 4 years	2 Checkups in 4 years	3 Checkups in 4 years	4 Checkups in 4 years

How many of your checkups were required by the university, your employer, insurance company, etc? _____

2. On the average, how many nights do you get 8 hours sleep during a one week period?

None	1 or 2	3 or 4	5 or 6	7

3. On the average how many cigarettes, cigars, or how much pipe tobacco do you smoke during a one week period?

None	Less than one packs	1 to 3 packs	4 to 7 packs	More than 7 packs

If you smoke, do you primarily smoke: cigarettes _____
a pipe _____
cigars _____

4. On the average, how many times do you become very stressed and tense during a one week period?

Never	1 or 2 times	3 or 4 times	5 or 6 times	7 or more times

5. On the average, how often do you neglect to wash you hands after using the bathroom or before eating a meal during a one week period?

Never	1 to 3 times	4 to 6 times	7 to 9 times	10 or more times

6. On the average, how often do you exercise your body hard (e.g., sports or jogging) for at least 15 minutes during a one week period?

Never	1 to 2 times	3 to 4 times	5 to 6 times	7 or more times

7. On the average, how many drinks of alcohol (liquor, beer, wine, etc.) do you have during a one week period?

None	1 to 3	4 to 6	7 to 9	10 or more

8. On the average, how often do you allow yourself to get cold or damp because you are not properly clothed during a one week period?

Never	1 or 2 times	3 or 4 times	5 or 6 times	7 or more times

9. On the average, on how many days do you eat something from each of the following four food groups (meat, fish, poultry, eggs, nuts) (milk or milk products) (bread or cereals) (fruits or vegetables) during a one week period?

None	1 or 2	3 or 4	5 or 6	