

## Hassles, hardiness and absenteeism: results of a 3-year longitudinal study

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In this 3-year longitudinal study of 229 full-time employees, the authors investigated the association between hassles, two measures of personality hardiness, and absenteeism verified from medical personnel records and self-reported hospitalization owing to injury and illness. Using stepwise multiple regression analysis, hassles, but neither of the hardiness measures, significantly predicted absenteeism when controlling for psychological well-being and relevant demographic variables over the 3-year period. The alternative measure of hardiness, but not any of the original Kobasa personality hardiness scales, predicted self-reported hospitalization for injury and illness. Little evidence for the predictive validity of the Kobasa personality hardiness components, or composite hardiness score, existed for either absenteeism or self-reported hospitalization in this study. These findings support the concept that the current conceptualization, measurement and use of the original Kobasa hardiness scales should be re-evaluated.

### 1. Introduction

A growing body of research supports a consistent, albeit modest, relationship between daily work and life hassles, personality hardiness and organizational outcomes in employed men and women (Kobasa 1979, 1982a,b, Kobasa *et al.* 1981, Kobasa *et al.* 1982a, Nowack 1991). Specific organizational stressors such as heavy job demands, role ambiguity, role conflict, poor communications between supervisors and employees, inadequate training, dysfunctional support systems, interpersonal conflict, inability to reach career goals, lack of feedback from supervisors, and lack of control over decision-making have consistently been shown to be associated with various productivity and diverse health problems (Taylor 1990, LaCroix and Haynes 1984, 1987, Rabkin and Struening 1976, Beehr and Newman 1978, Frew and Brunning 1987, Karasek *et al.* 1981). One approach to understanding this small, yet consistent, association between hassles and organizational outcomes has been to explore the role of specific individual variables such as personality hardiness on the stress-strain relationship.

Personality hardiness is typically conceptualized as a multi-dimensional construct consisting of internal locus of control (versus powerlessness), commitment to work and life activities (versus alienation), and perception of life changes and demands as a challenge (versus threat). Results from a growing body of studies suggest that personality hardiness may exert a protective effect against physical illness and psychological distress in the face of

work and life stressors (Ganellen and Blaney 1984, Kobasa *et al.* 1982b, Kobasa *et al.* 1983, Kobasa and Puccetti 1983, Pierce and Molloy 1990, Hills and Norvell 1991, Wiebe and McCallum 1986). However, some studies have failed to replicate the predicted association between hardiness and health status (Funk and Houston 1987, Schmied and Lawler 1986).

Hardy individuals may experience less physical illness and psychological distress because they are able to transform work and life events cognitively to diminish organismic strain, making them less stressful, or because this leads directly to adaptive coping responses on the job (e.g. health-enhancing lifestyle habits, optimistic explanatory styles, improved social support systems), ameliorating the potential negative effects of stress on overall health status. There is limited evidence suggesting that hardy individuals perceive stressful work and life events as more controllable and positive than individuals low in hardiness (Allred and Smith 1989, Rhodewalt and Agustdottir 1984, Rhodewalt and Zone 1989). In these studies, high-hardy individuals responded to high-stress conditions with more positive self-statements than did low-hardy individuals. Furthermore, high-hardy individuals tended to be more positive in high-stress situations than in low-stress situations, whereas low-hardy individuals were more positive in low-stress situations than in high-stress situations. These results provide support for the existence of a hardy cognitive style that acts to diminish either the importance or impact of perceived demands, threats, and challenges on well-being. Such hardy appraisals may lead to adaptive cognitions that are associated with lower psychophysiological reactivity to a wide variety of stressors at work and home.

However, in three studies exploring the psychophysiological concomitants of personality hardiness, only one empirical finding directly supports the hypothesis of a stress-dampening effect of personality hardiness (Contrada 1989). In his study of cardiovascular responses to laboratory stress in 68 male undergraduates, Contrada (1989) found that hardiness was significantly associated with reduced diastolic blood pressure responsiveness to a laboratory stressor (mirror-tracing task). Multiple regression analyses revealed that only the challenge component of hardiness, but not control or commitment, accounted for this relationship to the observed cardiovascular reactivity. In contrast, two other studies have found hardiness to be associated with enhanced, rather than diminished, cardiovascular reactivity (heart rate and systolic blood pressure) to controlled laboratory stressors (Allred and Smith 1989, Hull *et al.* 1987). Although the hardiness model would appear to predict diminished psychophysiological responses to stressors among hardy individuals, these findings suggest a more complex situation requiring replication and additional investigation.

Although Kobasa and her colleagues have offered numerous studies supporting the role of personality hardiness with health status, recent criticisms of the hardiness construct and measures have emerged including (1) the questionable psychometric properties of some of the hardiness scales; (2) the treatment of the hardiness construct as a unitary, rather than multi-dimensional, phenomenon; (3) the frequent use of inappropriate statistical techniques in previously published studies; (4) the paucity of empirical evidence that hardiness does, in fact, have a buffering effect; (5) the conceptualization of hardiness as a construct that is measured negatively as the absence of certain factors; and (6) the adequacy of existing research as evidence for hardiness effects or its independence from other relevant psychosocial constructs such as optimism, positive affect, negative affectivity, neuroticism, and repression (Funk and Houston 1987, Hull *et al.* 1987, Ganellen and Blaney 1984, Nowack 1989).

From a review of the published literature, it might appear that Kobasa and her colleagues have conducted numerous studies strongly supporting personality hardiness as a stress moderator. However, previous research on hardiness is particularly difficult to summarize for several reasons, particularly in light of several published studies by Kobasa based upon

the same data set (cf. Hull *et al.* 1987) and the counting of near-significant interactions as evidence of hardiness as a stress moderator (Kobasa and Puccetti 1983, Kobasa *et al.* 1983). In addition, many findings in the hardiness literature might be interpreted differently owing to inconsistencies in the way hardiness sub-scales have been used, or even measured, from study to study (Kobasa 1982a,b). The previous studies also vary as to whether they use an overall hardiness score in their analyses, or scores from separate sub-scales composing the construct (Ganellen and Blaney 1984, Schmied and Lawler 1986). While retaining the hardiness construct, researchers have frequently operationalized it in very diverse ways, complicating the interpretation of these studies.

Numerous studies have directly explored hardiness as a moderator of stress, organizational outcomes, and health status with other psychosocial variables (e.g. social support, exercise, type A behaviour). Of these studies using a composite measure of hardiness, few have found consistent evidence for a moderating effect. Overall, the empirical evidence that the personality hardiness construct operates as a stress buffer is weak, at best. However, except for a recent study by Schmied and Lawler (1986), most research suggests the concept that personality hardiness assessed by the Kobasa scales has direct and main effect influences on well-being. In their study of working women, Schmied and Lawler (1986) found no significant main effect of hardiness and no hardiness  $\times$  stress interaction in a measure of recent physical illness.

Several recent criticisms have centred on the construct validity and reliability of the hardiness measures. It is important to emphasize that in Kobasa's initial conceptualization, hardiness was conceived as consisting of three components of a single inseparable constellation, and not as independent aspects. Recently, Carver (1989) has raised questions about the nature of this multifaceted construct and recent factor analyses have consistently failed to reproduce separate commitment, control, and challenge components (Funk 1992, Funk and Houston 1987, Hull *et al.* 1987). Additionally, modest correlations between the pairs of scales used to measure each of the three components as well as low intercorrelations between the components are typically found in the hardiness literature (Kobasa *et al.* 1981, Hull *et al.* 1987, Pierce and Molloy 1990). These low correlations do not support the view that the personality hardiness construct consists of 'inextricably intertwined aspects that bear a considerable resemblance to each other' (Kobasa 1979, p. 369). Although some components of hardiness may prove to ameliorate the negative effects of work and life stress, it is unclear exactly what these components are, and whether they should be considered separately or treated as a single meaningful construct (Carver 1989).

In their review of the hardiness construct, Hull *et al.* (1987) proposed that the challenge sub-scale should be eliminated and that only the commitment and control sub-scales should be utilized in future hardiness research. They found the psychometric properties of the commitment scale 'quite acceptable' (p. 529) but those of the control scale more doubtful, suggesting that only the Rotter (1966) Internal-External (I-E) scale should be used instead. Hull *et al.* (1987) also examined the validity of the hardiness components and concluded that control and commitment are related to health status, but that challenge is not. More recently, Roth *et al.* (1989) explored the effects of exercise participation, self-perceived fitness level, and hardiness for promoting stress resistance in a sample of 373 college students. Challenge was found to be virtually unrelated to any measure, including the other hardiness components, leading the researchers to conclude that this component, as it is currently measured, offers little benefit to health (Wiebe 1989).

Some limited findings in the literature on sensation-seeking appear to be somewhat contradictory to the conclusions of Hull *et al.* (1987) and Wiebe *et al.* (1989) that challenge and health status are completely unrelated (Contrada 1989, Smith *et al.* 1978, Zuckerman

*et al.* 1978). Sensation-seeking, as initially defined and measured by Zuckerman (1964, 1971), appears to be conceptually very similar to the hardiness component of challenge. High scores on sensation-seeking reflect an individual's openness to changing situations and to appraise them as interesting incentives to growth that are normal and challenging rather than threats to security. For example, in the study by Smith *et al.* (1978), individuals low in sensation-seeking experienced greater physical illness than those with higher scores in the face of the stress of negative life events. In a 4-month longitudinal design, Nowack (1986) found hardiness to have a significant main effect on both psychological distress and job burnout when controlling for initial levels of health status. In that study, the sensation-seeking scale was used to measure the challenge component of composite hardiness. However, separate analyses of the hardiness components were not reported, making this finding difficult to interpret.

Contrada (1989), in his recent exploration of hardiness, type A behaviour, and cardiovascular reactivity to psychological stress, found that the challenge component of hardiness was uniquely and significantly associated with diastolic blood pressure responsiveness to a controlled laboratory stressor. His results suggest that individuals high in challenge showed lowered physiological reactivity to a frustrating task that is consistent with the conceptualization of challenge as a tendency to view change in a positive manner (Kobasa 1979). Taken together, these studies tend to suggest that the concept of challenge, conceptualized and measured differently, may indeed be associated with psychophysiological reactivity and well-being. Although evidence is limited, the relationship between challenge, organizational outcomes, and health status would appear to warrant further investigation.

Funk and Houston (1987) raised earlier concerns about the appropriateness of the use of analysis of variance (ANOVA) or covariance in previous empirical studies on personality hardiness. Hardiness has frequently been found to be significantly correlated with independent variables used in these studies violating the assumption of independence among factors. For this reason, multiple regression analysis is generally a preferred method of statistical analysis because of its capacity to assess the effect of each factor while controlling for the others. In fact, when Funk and Houston (1987) used ANOVA, the results of their findings with hardiness and health outcomes were similar to those of previous studies but quite different when regression analyses were employed.

Finally, several recent criticisms have centred on the validity of the hardiness measures. During the early years of hardiness research, as many as 19 different scales were used to assess this construct. It was not uncommon for authors to modify versions of the initial hardiness scales or to use alternative scales to measure specific dimensions of hardiness (Nowack 1986, Kobasa 1979, Kobasa and Puccetti 1983). An inventory of 71 items became the most widely used measure of Kobasa's initial conceptualization of the hardiness dimensions of commitment, control, and challenge (UHS; Unabridged Hardiness Scale). Second-generation measures followed in 1982 (a 20-item Abridged Hardiness Scale and a 36-item Revised Hardiness Scale) and new 'third-generation' scales have since been developed; the 50-item Personal Views Survey (PVS; Hardiness Institute 1985), the 45-item Dispositional Resilience Scale (DRS; Bartone *et al.* 1989), and the 30-item Cognitive Hardiness Scale (CHS; Nowack 1990, 1991). The PVS and DRS share similar formats and item contents to the original Kobasa scales, contain both positively and negatively keyed items, and provide separate measures of the three hardiness dimensions. The CHS was rationally derived from the three hardiness dimensions, it also contains positively and negatively keyed items, but unlike the PVS and DRS, it provides only a global measure of the hardiness construct. A more complete and thorough review of the development of the hardiness measures can be

found in the recent review of the theory and research of the hardiness construct by Funk (1992).

The diversity in measures of this personality construct makes the body of hardiness research difficult to interpret. As such, differences in health outcomes across hardiness studies may be due to the scales being used, rather than a true hardiness effect. Despite a growing literature, the true relationship between hardiness and health status remains somewhat elusive and unclear. In the light of these recent criticisms of the hardiness construct and research literature, this study was designed to compare an alternative measure of hardiness (CHS) with the original Kobasa scales using a 3-year prospective design with diverse health outcomes. Specifically, this study investigated the association of hassles, composite and component Kobasa personality hardiness scales, and an alternative cognitive hardiness scale (CHS) with absenteeism (based on physical illness verified from medical personnel records and self-reported hospitalization owing to injury and illness). The study involved 229 employees over a 3-year period. In this study the authors examined personality hardiness as it is commonly measured, despite the criticisms mentioned earlier. Although not providing a solution to these criticisms, this study remains applicable to the previous literature in that a new measure of the hardiness construct and both self-report and organizational measures of absenteeism reflecting health status were included. Consistent with previous research, it was hypothesized that personality hardiness would have direct, but not moderating, effects on the objective measure of absenteeism and subjective report of hospitalization owing to illness or injury assessed in this study.

## 2. Methods

### 2.1. Participants and procedures

The data utilized in this report were drawn from a broader longitudinal study investigating the predictors of job performance, stress resistance and health in a police population (LAPD 1989). In 1983, the newly-hired employees were administered a comprehensive battery of psychological questionnaires and behavioural assessments. As part of a broader police department study protocol, exactly three years later the same assessment battery was re-administered to all remaining employees. A total of 229 employees were included in the present sample for analysis. The subjects in this study were 69 % male and 31 % female with a mean age of 25.3 years ( $SD = 3.54$  years). The sample of 229 full-time employees were 18.8 % African-American, 25.3 % Latino/Hispanic, 3.9 % Asian, and 52.0 % Caucasian. All dependent measures analysed in this study were collected in 1986, three years after initial measures were administered.

### 2.2. Measures

2.2.1. *Independent variables*: the two independent variables were hassles and hardiness.

- (1) *Hassles*: Perceptions of recent work and life stress were measured using a brief 6-item scale based upon factor analytic procedures from the original 117-item *Hassles Scale* (Kanner *et al.* 1981). The original Hassles Scale has correlated more strongly than life events measure of stress to a wide variety of health outcomes in a number of recent studies (Kanner *et al.* 1981, Monroe 1983). The derived hassles scale used in this study assessed six independent factors of daily living including the following areas of concern: work, health, family, financial, social and environmental. Specific examples of hassles were provided to respondents in each of the six major factor analytically derived categories of work and life stressors (Nowack 1990).

This hassle scale has demonstrated internal consistency reliability ( $\alpha = .68$ ), test re-test reliability over a two-week period ( $\alpha = .68$ ) and has been shown to be associated with immune responsiveness, job burnout, physical illness and absenteeism derived from personnel records in several recent studies (Nowack 1994, 1989, 1991, Schwartz *et al.* 1992). Schwartz *et al.* (1992) found that this measure of hassles was significantly associated with change in immune function in a prospective study of 110 elderly adults between the ages of 60 and 70 years who participated in an 11-day intensive health promotion programme. In that study, respondents who reported experiencing a decrease in perceived stress over the 3-month period showed significant increases in lymphocytes ( $r = .31, p < .01$ ).

Respondents rate how frequently they have experienced or appraised six work and life hassles categories over a period of 3 months using a 1 to 5 rating scale, where 1 = never and 5 = always. High scores suggest the appraisal of high levels of work and life hassles over a period of 3 months. As such, the present scale measures the respondent's perception and appraisal of experienced stressfulness in broad categories of work and life situations, rather than frequency or occurrence of specific or major life events. This scale demonstrated a moderate internal consistency reliability ( $\alpha$ ) of .69 in the present study.

- (2) *Hardiness*: Two measures of hardiness were used in the present study—the 36-item Revised Hardiness Scale (Kobasa 1982c) and the 30-item Cognitive Hardiness Scale (CHS; Nowack 1990, 1991). As noted earlier, hardiness has been measured with diverse methods and combination of scales in previous research studies. Unfortunately, it is still unclear which method is the most reliable and valid assessment of this construct.

The 36-item Revised Hardiness Scale (Kobasa 1982c) consists of a subset of the original hardiness scale items based upon principal component factor analytic procedures with Kobasa's original empirical dataset of business executives. Items with a factor loading of more than .30 on one, and only one, of the factors were selected for inclusion in the refined hardiness composite. Kobasa (1982c) stated that the refined scale (consisting of 12 commitment, 16 control and 8 challenge items) showed adequate internal consistency reliability ( $\alpha$ ) of .86 and correlated with the longer composite scale at .89. Furthermore, Kobasa (1982c) reported that all major findings were replicated when this scale was substituted for the full scale in her earlier research studies. Hull *et al.* (1987) replicated the usual hardiness-health relation with the Revised scale and reported a correlation of .76 between the original long form and the 36-item Revised Hardiness scale. This independent validation study provides additional construct validity for this particular 36-item Refined version of the original hardiness scales.

The 30-item Cognitive Hardiness Scale (Nowack 1990, 1991) is composed of both positive and negative attitudes and beliefs about work and life including:

- (a) *Commitment/involvement*: emotional commitment and involvement, as opposed to alienation, to one's work, family, self, hobbies, etc.;
- (b) *Challenge*: attitudes and beliefs concerned with viewing life changes as normal and providing opportunities for growth rather than threats; and
- (c) *Perceived control*: beliefs that one has a sense of control and can be influential over significant outcomes in work, relationships, and life in general.

The inclusion of items that assess both positive and negative indicators of the hardiness construct in the present scale may minimize the conceptual and empirical problems present in the current Kobasa hardiness measures (cf. Funk and Houston

1987). Respondents were asked to rate how strongly they agree with specific statements about their beliefs on a 1–5 scale ('strongly agree', 'agree', 'neither agree nor disagree', 'disagree', 'strongly disagree', respectively). Sample items included, 'My involvement in non-work activities and hobbies provides me with a sense of meaning and purpose', 'I am committed to my job and work activities that I am currently pursuing', and 'I tend to view most work and life changes, disappointments, and setbacks as threatening, harmful, or stressful rather than challenging'. This scale demonstrated a moderate internal consistency reliability ( $\alpha$ ) of .84 in the present study.

The CHS has demonstrated adequate internal consistency reliability ( $\alpha = .83$ ), adequate test re-test reliability over a period of two-weeks ( $\alpha = .95$ ), moderate stability over the 3-year study period ( $\alpha = .55$ ), and criterion-related validity with diverse organizational (absenteeism, job satisfaction) and self-report health outcome measures (job burnout, physical illness, psychological well-being, and mood states) in several recent retrospective and prospective studies (Andrassy 1992, Schwartz *et al.* 1992, Nowack 1989, 1990, 1991, 1994). This scale has also been found to significantly contribute to predictions of both problem- and emotion-focused coping as well as significantly correlated ( $r = .74, p < .01$ ) with the Scheier and Carver (1985) Life Orientation Test measure of optimism in a recent unpublished study (Andrassy 1992). Principal component factor analytic procedures of the Cognitive Hardiness scale across diverse samples typically identify seven to eight factors with eigenvalues exceeding 1.0 that account for approximately 55 % of the explained variance in this variable. The first three factors include items reflecting challenge, control and commitment but generally account for no more than 30 % of the explained variance in these analyses.

The CHS has shown some limited evidence of independence of negative affectivity (NA) in two recent unpublished studies (Nowack 1992, Schwartz *et al.* 1992). In the first study, four groups of subjects ( $n = 122$ ) between the ages of 60 and 70 years were pretested and retested 3 months and one year after participating in an 11-day intensive preventive health promotion programme for the elderly. As part of a battery of psychological and biological variables, hardiness (CHS), negative affectivity (NA), defensiveness, and psychological distress (SCL-90) were obtained. For the total sample, CHS uniquely and significantly contributed to predictions of somatic symptoms and incrementally to interpersonal sensitivity and interpersonal paranoia (cynical mistrust) after controlling for NA in the first step of stepwise multiple regression analyses. The second study explored the psychosocial predictors of burnout and substance use in 897 professional working women (Nowack 1992). A statistically significant correlation was found between the CHS, hassles, and the emotional exhaustion scale of job burnout ( $r(897) = -.46$  and  $-.44$ , respectively, both  $p < .01$ ). Partial correlation coefficients were also calculated controlling for negative affectivity using a measure of psychological distress that has shown a previous association with diverse measures of neuroticism (Nowack 1990). Although not as strongly associated, the CHS was still significantly correlated with hassles and emotional exhaustion ( $r = -.19$  and  $-.20$ , respectively,  $p < .01$ ) in this sample.

2.2.2. *Dependent variables:* the dependent variables were absenteeism, hospitalization and psychological well-being.

- (1) *Absenteeism*: Absenteeism owing to physical illness was measured by cumulative sick time verified from medical personnel records for each of the 229 employees over the 3-year study period. Medical personnel records were obtained for each participant and analysed for actual illness, or illness complaints, over the course of the study. A random sample of 30 employee files were also analysed to determine whether this illness, or illness complaint measure, was confounded by family or other personal non-health related problems (which were categorized in the personnel records by another category) other than cumulative sick time. In these 30 randomly-selected employee files, no evidence was found to suggest contamination of this measure by job dissatisfaction, family member illness, or family-related demands that might result in employee sick time. Therefore, this measure of absenteeism would appear to represent actual illness, or illness complaints, over the 3-year study. Although it was not possible to separate true physical illness from illness behaviour (complaints), this measure does reflect actual employee absences that affected the organization.
- (2) *Hospitalization*: Hospitalization owing to illness or injury was measured by a single self-report item over the 3-year study period. Respondents were asked to endorse whether or not they had been hospitalized during the study period for any injuries, accidents or illnesses that they had experienced. This single-item measure assessed work and non-work related illness or injury that required hospitalized medical attention that kept the respondent from working or functioning normally at any time over the 3-year study period.
- (3) *Psychological well-being*: Psychological well-being was measured with a 12-item scale assessing overall work and life satisfaction. This scale has shown adequate internal consistency reliability ( $\alpha$ ) of .93, test re-test reliability over a 2-week period of .86, and criterion-related validity in recent studies (Nowack 1990). Respondents were asked how frequently they experienced specific feelings on a 1 to 5 scale (1 = never and 5 = always). Sample items included: 'Able to relax and enjoy yourself without worry'; 'Feeling positive, confident, and secure with yourself', and 'Pleased with your life overall'.

### 3. Results

The intercorrelations among the independent variables at time 1 and dependent variables at time 2 are shown in table 1. The CHS was significantly associated with all of the Kobasa scales except for the challenge sub-scale (correlations with the overall Kobasa hardiness scale, commitment, challenge, and control sub-scales are  $-.46$ ,  $-.42$ ,  $.05$ , and  $-.58$ , respectively).

Series of separate multiple regression analyses were used to explore the relative contributions of hassles and the two hardiness measures with the objective absenteeism and subjective health measures included in this study. The first series of regression analyses explored the contributions of hassles, the composite Kobasa measure of personality hardiness, and the CHS, to predictions of absenteeism and self-reported hospitalization owing to injury or illness over the 3-year study period. The second analyses explored the contributions of hassles, the three sub-components of the original Kobasa scale (commitment, challenge, control), and the CHS to predictions with the same dependent measures. Finally, a third set of regression analyses explored only the contributions of hassles and the original Kobasa sub-scales to predictions of absenteeism and hospitalization. In all of the above regression analyses, two demographic variables (ethnicity, age) were



Table 1. Intercorrelations of the scales (*n* = 229).

Scale	1	2	3	4	5	6	7	8	9	10	11	12	Mean	SD	Reliability <sup>1</sup>
(1) Commitment		.02	.49**	.76*	.22**	-.42**	-.01	-.28**	.08	.04	.13	.09	0.0	1.0	.73
(2) Challenge			.08	.53**	.07	.05	.00	.06	.06	.02	.10	.06	0.0	1.0	.71
(3) Control				.75**	.29**	-.58**	.00	-.27**	.07	.09	.08	.05	0.0	1.0	.44
(4) Hardiness					.29**	-.46**	.01	-.24**	.01	.02	.06	-.10	0.0	1.0	.86
(5) Hassles						-.34**	.15*	-.26**	.10	.01	.09	.03	13.55	3.68	.70
(6) Cognitive Hardiness Scale (CHS)							-.09	.42**	-.17*	.04	.01	.00	109.41	11.23	.83
(7) Absenteeism								-.12	.12	.09	.01	-.09	1.39	0.86	.46 <sup>2</sup>
(8) Psychological well-being									-.13	.06	.03	.03	44.10	7.13	.93
(9) Hospitalization										.10	.01	-.09	1.04	0.19	-.3
(10) Age											.15*	-.08	25.28	3.54	-.3
(11) Gender												-.09			-.3
(12) Ethnicity															-.3

\* *p* < .05; \*\* *p* < .01.

<sup>1</sup>Internal consistency reliability is measured by Cronbach's  $\alpha$ .

<sup>2</sup>Test re-test reliability over the 3-year study period.

<sup>3</sup>Internal consistency or test re-test reliabilities are not appropriate for these variables.

Note. These intercorrelations represent the independent variables of lassless, Kobasa hardiness, Cognitive Hardiness Scale, hassles, and psychological distress scales assessed at time 1, with the dependent measures of absenteeism and hospitalization assessed at the end of the 3-year study period.

Table 2. Results of the multiple regression analyses, with absenteeism and self-reported hospitalization as the dependent variables ( $n = 229$ ).†

Absenteeism (verified from medical records)	RSQ	RSQ change	$\beta$	T
Psychological well-being	.000	.000	-.049	NS
Ethnicity	.000	.000	-.012	NS
Age	.000	.000	.071	NS
Hassles	.022	.022	.148	2.27*
<i>Self-reported hospitalization</i>				
Psychological well-being	.000	.000	-.049	NS
Ethnicity	.000	.000	-.012	NS
Age	.000	.000	.071	NS
CHS	.032	.032	-.174	2.66*

\*  $p < .05$ ; \*\*  $p < .01$ . NS = not significant.

† Hassles, psychological well-being, ethnicity, age, commitment, control, challenge, and CHS are independent variables.

Note. No interaction terms significantly contributed to predictions of absenteeism or self-reported hospitalization in these regression analyses.

entered in the first step of the regression analyses followed by hassles, the Kobasa hardiness scales, CHS, and relevant interaction terms, in that order. Additionally, psychological well-being was also entered in the first step to minimize the effect of negative affectivity on self-reported health status (Burke *et al.* 1993, Watson and Pennebaker 1989, Watson and Clark 1984). Interaction terms between hassles and the two measures of hardiness were also calculated separately and entered in the last step of the regression analyses in a stepwise fashion to investigate possible moderating effects. These regression analyses allowed for the determination of the unique contributions of hassles and measures of hardiness above those of the demographic variables and psychological well-being, and also allowed for testing possible moderating effects of these variables on measures of absenteeism and self-reported hospitalization over the 3-year period.

Table 2 summarizes the results of the stepwise regression analyses that were used to determine the predictors of absenteeism measured as physical illness (cumulative sick time) verified by medical personnel records and self-reported hospitalization owing to work-related injury or illness over the 3-year study period. With respect to absenteeism verified from personnel records, hassles, but none of the hardiness measures, significantly contributed to predictions of physical illness over the 3-year study period ( $F = 5.15$ ,  $p < .05$ ), accounting for only .02 of the variance in this dependent measure in the separate regression analyses (table 2). With respect to self-reported hospitalization, only the CHS, but not any of the Kobasa personality hardiness scales, significantly contributed to work-related injuries or illnesses resulting in hospitalization over the same 3-year period ( $F(r^2 \text{ change}) = 7.07$ ,  $p < .01$ ). No evidence of any significant moderating effects was observed in any of the above regression analyses. A series of additional stepwise regression analyses were conducted with only the Kobasa hardiness scales (i.e. excluding the CHS) to explore the contributions of these scales to predictions of change of physical illness and self-reported hospitalization. Neither the overall Kobasa hardiness score, nor any of the subscale scores (commitment, control, challenge), significantly contributed to predictions of physical illness or self-reported hospitalization in this prospective study. Additionally, no demographic variables significantly contributed to predictions of either absenteeism or hospitalization in these analyses.

#### 4. Discussion

Among personal resources relevant to stress resistance, personality hardiness has received a great deal of attention. Previous research, however, has been largely limited to retrospective studies of self-strain, reported illness, or somatic complaints that failed to take into account conceptual and psychometric criticisms of the Kobasa hardiness scales. The present investigation with 229 full-time employees explored the association between hassles and two different measures of hardiness with absenteeism and self-reported hospitalization in a 3-year prospective design.

In this study hassles, but not personality hardiness, significantly contributed to predictions of absenteeism assessed as physical illness verified by employee personnel records over a period of 3 years after controlling for relevant demographic variables and psychological well-being. In general, individuals who reported greater levels of work and life hassles experienced significantly greater absenteeism owing to physical illness, or illness complaints, than those reporting less hassles. This finding is particularly interesting in light of the brief hassles measure used in this study (Nowack 1990, Schwartz *et al.* 1992), its moderate test-retest stability over the 3-year study period (.61) and previous research suggesting that this type of hassles scale is typically conceptually confounded with negative affectivity (Watson and Pennebaker 1989, Burke *et al.* 1993). As Watson and Pennebaker (1989) point out, it is likely that most stress-complaint correlations (subjectively defined) are overestimating the true association between hassles and health status.

Despite the fact that so little variance in absenteeism is explained by hassles, this prospective study provides some limited support for the interpretation that hassles, conceptualized and measured as an appraisal of chronic concerns and minor irritants, is significantly associated with absenteeism. Although the assessment of absenteeism as physical illness used in the present study was based upon review of existing medical personnel records, it is not entirely possible to distinguish between true illness *per se*, or illness complaints, resulting in employee absences from work over the 3-year period. Despite this limitation, this study provides support for a positive association between hassles and absenteeism in a longitudinal design after controlling for initial levels of psychological well-being to control for the potential hassles-negative affectivity confound. The small variance in absenteeism explained by hassles is not entirely surprising given the length of the study period (3 years), the potential error in measurement of absenteeism (verification from personnel records) and other salient personal and organizational factors that might be hypothesized to contribute to missed days of work in a police population (e.g. organizational climate, family balance issues, shiftwork, salary/benefits, etc.).

In this study, the 30-item CHS (Nowack 1990, 1991), but not any of the original Kobasa hardiness scales, significantly contributed to predictions of self-reported hospitalization over the 3-year period. This finding provides limited construct and predictive validity for the CHS, but little evidence of validity for the original Kobasa measures (composite or subscales) with either absenteeism or self-reported hospitalization assessed in this study. These results generally support the overall findings of Schmied and Lawler (1986) who found no association between a measure of composite hardiness and a measure of physical illness in a sample of working women, but contradict other studies finding a relationship between composite hardiness and other health measures (Kobasa 1982a,b or c, Wiebe and McCallum 1986, Kobasa, Maddi, Puccetti & Zola 1985).

It is important to note that most interpretations of the hardiness-health relationship have been based on empirical studies that have been largely retrospective in design and included primarily subjective physical and psychological health outcome measures. One explanation for the current results and previous literature findings showing main and moderating effects

of hardiness on health is that personality hardiness, as conceptualized and measured by Kobasa (1979), may actually be tapping general psychopathology and contain a substantial negative affectivity component itself. As a result, the relationship between CHS and self-reported hospitalization found in the present study may simply be a consequence of a confound between these measures and negative affect. In fact, recent reviews of the hardiness literature have concluded that, in general, hardiness measures tend to be significantly associated with indicators of negative affect (Funk 1992, Allred and Smith 1989, Hull *et al.* 1987).

Although hardiness and negative affect measures appear to overlap, they are not apparently identical. Some studies do indicate that relations between hardiness and well-being could not be replicated when negative affect was statistically controlled (Funk and Houston 1987, Rhodewalt and Zone 1989, Allred and Smith 1989). In other studies, controls for negative affect did not eliminate effects for hardiness on outcomes other than physical illness. For example, Funk and Houston (1987) in their prospective study found that main effects of hardiness on depression remained after controlling for maladjustment. Although they conclude that hardiness does not appear to be essentially another measure of psychological maladjustment, 'there is a significant overlap between the measures of each concept' (Funk and Houston 1987, p. 578). In a recent study with 234 male highway patrol officers (Hills and Norvell 1991), hardiness significantly contributed incrementally to predictions of self-reported physical symptoms above that of neuroticism and perceived hassles. Finally, Allred and Smith (1989) found that main effects of hardiness and positive coping statements as well as blood pressure reactivity remained after negative affect was statistically controlled. Taken together, these findings provide limited support for the argument that personality hardiness may indeed have some direct effects on health status and may not simply be a measure of general maladjustment or negative affectivity. Further research is obviously needed to explore and clarify the potential confound between hardiness and measures of positive affect and negative emotionality.

In general, the empirical literature on personality hardiness as a mediator of hassles and health is provocative, yet inconclusive. While there are perhaps too many supportive findings to dismiss the possibility that the perceptions of commitment, control and challenge may ameliorate the impact of hassles on health, the effect is far from established. The results of this study also support the findings of Funk (1992), Hull *et al.* (1987), and Funk and Houston (1987) who suggest that the concept of hardiness is not well operationalized by the original Kobasa measures. Based upon reviews of the hardiness literature, it would appear that future research in this area would benefit from a continued reconceptualization of the hardiness construct and its measurement. Several specific recommendations to improve research in this area are summarized below.

First, future applied research with newer 'third-generation' hardiness measures should shed light on recent criticisms of using overall hardiness scores (Carver 1989) or even specific sub-scales, such as challenge, that appear to have mixed results with diverse health outcomes (Contrada 1989, Hull *et al.* 1987). These studies should explore the relative contributions of the hardiness components as well as overall scores to elucidate the relative contributions of the hardiness construct to health status. Second, future exploration of each of the individual hardiness components, particularly control and commitment, would appear warranted in light of previous research findings. Despite suggestions that the challenge component of hardiness should not be included in future research (Hull *et al.* 1987), current findings by Contrada (1989) suggest that this recommendation may be premature. Replication and extension of the Contrada (1989) study is obviously needed to clarify the role of challenge, as it is typically conceptualized and measured, with diverse physical and psychological health outcomes.

Third, future applied research with hardiness should routinely include a measure of negative affect so that its influence can be identified and isolated. Individual difference factors such as hardiness may well prove to be significantly associated with objective measures of health status, but subjective health complaint and symptom measures most likely overestimate this relationship. Since negative affect has been consistently shown to be related to subjective health outcomes, but not strongly to objective health outcomes, any study without inclusion of a measure of negative affect remains difficult to interpret fully (Burke *et al.* 1993, Watson and Pennebaker 1989). Fourth, future hardiness studies should include measures of defensiveness, self-deception, and repression to explore if, and how, they are related to each other. Based on previous research indicating that repressive coping styles (conceptualized and defined by a combination of low negative affect and high social desirability) may be associated with greater autonomic activity and risk for physical illness (cf. Schwartz 1990), it might be interesting to speculate that some defensive individuals who report high levels of hardiness may actually be subjected to deleterious health consequences under stressful work and life conditions. These defensively hardy individuals may actually prove to be more susceptible to negative health outcomes owing to direct psychophysiological reactions or indirectly through adverse lifestyle coping behaviours. Additional research in this area could test these hypotheses directly and clarify such relationships.

Finally, inclusion of the CHS in future research studies appears warranted, based on the results of the present study. The CHS appears to be most conceptually consistent with current conceptualizations of optimism and most predictive of the 'cynical mistrust' components of the SCL-90 in a recent unpublished study (Schwartz *et al.* 1992). Future research should continue to establish the construct validity of this measure as well as its potential confound with negative affect. Although current research suggests that the Kobasa individual-difference measures should be used cautiously, this does not necessarily mean that hardiness, as a cognitive stress-resistant factor, should be entirely abandoned in future stress-illness studies. In general, current research suggests that a hardy cognitive outlook and explanatory style including optimism, internal locus of control, and self-appraisal may be directly related to healthy functioning (Taylor 1990, Taylor and Brown 1988).

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