

Hardiness Training for High-Risk Undergraduates

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We evaluated the effectiveness of hardiness training in improving the retention rates and grade-point averages of first-semester high-risk undergraduates. Undergraduates in the experimental group underwent hardiness training as a regular semester course. The control group consisted of demographically comparable undergraduates who underwent either a traditional student-enrichment or a leadership-training class. These control-group courses were taught by the instructors of the hardiness-training classes. At the end of the year following training, the experimental group showed a significantly higher increase in grade-point average and a trend toward greater retention than did the control group.

KEY WORDS: at-risk, hardiness, retention

Since the 1980s, researchers have recognized hardiness as a pattern of attitudes and skills that enhance performance, conduct, morale, and health despite stressful circumstances (Maddi, 2002). Because of its relevance to resiliency, hardiness has also been successfully implemented in training sessions designed to improve performance (Maddi & Khoshaba, 2002). Building on previous studies with working adults (Maddi, 1987; Maddi, Kahn, & Maddi, 1998), we evaluated the effectiveness of hardiness training with high-risk undergraduates. We present our findings and discuss the means by which advisors might use hardiness assessment and training to identify and serve at-risk undergraduates.

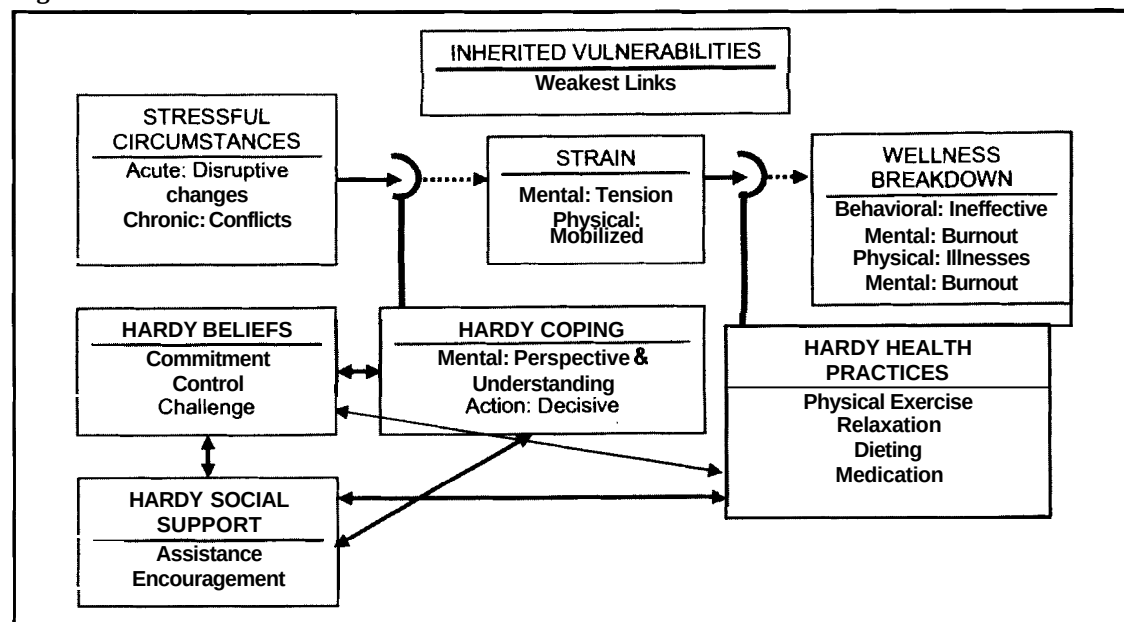
Hardiness was first identified in a 12-year longitudinal study at Illinois Bell Telephone (IBT) (Maddi & Kobasa, 1984). Each year, the 450 managers studied were psychologically and medically tested. Six years into the longitudinal design, federal deregulation severely disrupted the entire telecommunications industry, including IBT and its workforce. In the following 6 years, two thirds of the sample showed signs of performance and health breakdown, but the others not only survived but thrived. Scrutiny of the 6 years of data taken prior

to deregulation showed that managers who thrived showed a much stronger pattern of hardiness attitudes and skills than did those whose performance and health suffered (Maddi & Kobasa, 1984).

We used results of the IBT and later studies (Khoshaba & Maddi, 1999; Maddi, 1998; Maddi & Kobasa, 1984) to generate the hardiness model depicted in Figure 1. Consistent with other research (Selye, 1976), the flowchart shows that the accumulation of acute stresses (disruptive changes) and chronic stresses (continuing conflicts) fuel the organism's strain (fight or flight) reaction, which if unabated too long, depletes bodily resources sufficiently to increase the risk of breakdowns in performance and health. The existence of genetic vulnerabilities can accelerate this breakdown process. However, the presence of hardiness attitudes and skills can lead to mental perspectives and actions that decrease the stressfulness of circumstances and the behavioral reaction to them (Maddi, 1990, 1994; Maddi & Khoshaba, 1984, 2002). This stress mastery (Maddi, 1990, 1994) can lead to enhanced performance and health despite (and even as the result of) situational pressures.

The hardiness attitudes are constituted by the 3Cs of commitment, control, and challenge (Kobasa, 1979; Maddi & Kobasa, 1984). A person strong in commitment wants to stay involved with people and events; he or she may see withdrawal into isolation as a wasteful choice. One strong in control expresses the belief that one should try to influence outcomes; she or he may see passivity and powerlessness as wasteful choices. An individual strong in challenge appreciates the opportunity to learn from ongoing experiences, whether they are positive or negative, to grow in wisdom; this person may think that to expect easy comfort and security is naive. Together, the 3Cs of hardiness attitudes provide the courage and motivation one needs to become involved in stress mastery (Maddi, 2002).

Early hardiness attitudes research was plagued by measurement problems (Funk, 1992). The first hardiness attitudes measure was developed for adults (Kobasa, Maddi, & Kahn, 1982); therefore,

Figure 1 The hardiness model

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when it was used with undergraduates, the results sometimes showed insufficient intercorrelations of commitment, control, and challenge to warrant considering a total score in the analysis of hardiness (Funk & Houston, 1987; Hull, Van Treuren, & Virnelli, 1987). Later hardiness attitudes measures, including the one utilized in our study, seem to have corrected this problem (Maddi, 1997; Sinclair & Tetrick, 2000). Furthermore, the first hardiness measure, which was heavily loaded with negatively worded items, appeared from its correlates as if it might be little more than the opposite of negative affectivity (Hull et al., 1987). Subsequent hardiness measures have balanced negatively with positively worded items. Although these later measures still correlated negatively with indices of negative affectivity, the magnitudes were lower, and many external validity correlates, not based on self-reports, have been established (Maddi, 1997, 2001). Furthermore, Maddi and Khoshaba (1994) have shown that the pattern of relationships between the hardiness attitudes measure used in the present studies and Minnesota Multiphasic Personality Inventory (MMPI) variables persists after negative affectivity has been controlled.

Furthermore, in a study emphasizing item wording, Sinclair and Tetrick (2000) found evidence that the empirical results are hierarchically structured with the three subdimensions of commitment, control, and challenge nested under a second-order fac-

tor of hardiness. Although the positively worded hardiness items are more distinct from negative affectivity than are the negatively worded items, Sinclair and Tetrick (2000) found that hardiness measures are not simply representing negative affectivity. However, because both positively and negatively worded items have theoretically relevant external correlates, they caution against separating the items into two different measures of hardiness.

In the years that followed the completion of the IBT project, many researchers have considered the role of hardiness attitudes in various aspects of functioning. They gathered evidence through use of current hardiness measures and showed, as expected, that although commitment, control, and challenge are interrelated, they are not redundant with each other (e.g., Maddi, 1994, 1997). To demonstrate the construct validity of the hardiness composite, participants in an experiential sampling study (Maddi, 1999) were paged at random and asked to comment on the nature of their ongoing activities. Results showed a positive relationship between hardiness and a) involvement with others and events of ongoing activities (commitment), b) the sense that participants had chosen and had influence over the activities (control), and c) the positive process of learning from the circumstances (challenge).

By looking at the accumulated findings that are based on current measures, one finds that hardiness renders positivity and resiliency to individuals

meeting change. For example, hardiness seems to provide a buffering effect between stresses and illness symptoms (Bartone, Ursano, Wright, & Ingraham, 1989; Kobasa, Maddi, & Kahn, 1982; Kuo & Tsai, 1986). Under stress, in addition to experiencing fewer stress-related symptoms, hardy people also seem to perform better than their less-hardy peers. For example, researchers have found positive relationships between hardiness and subsequent a) basketball performance among varsity players (Maddi & Hess, 1992), b) success rates in officer training school for the Israeli military (Florian, Milkulincer, & Taubman, 1995; Westman, 1990), c) retention rate and grade-point average (GPA) in college students (Lifton, Seay, & Bushke, 2000), and d) speed of recovery of baseline functioning following the disruption of culture shock (Atella, 1989).

As shown in Figure 1, individuals who are motivated to enact hardiness skills utilize the mechanisms for triggering beneficial performances (Khoshaba & Maddi, 2001). They use skills for transformational coping (solving problems, rather than denying and avoiding them), activistic social support (giving and getting assistance and encouragement, rather than overprotection or competition), and self-care (in the form of relaxation, nutrition, and exercise regimens oriented toward moderating arousal to the level that facilitates coping and social support efforts). Researchers found that, consistent with hardiness theory, hardiness attitudes are related to the tendency of high-performing people to view life events as less stressful (Ghorbani, Watson, & Morris, 2000; Rhodewalt & Zone, 1989), cope transformationally with stressful events (Maddi, 1999; Maddi & Hightower, 1999), avoid excessive physiological arousal (Allred & Smith, 1989; Contrada, 1989), and pursue positive while avoiding negative health practices (Maddi, Wadhwa, & Haier, 1996; Weibe & McCallum, 1986).

Data from intervention studies complete the hardiness picture. In one study, participants undergoing hardiness training showed not only increased hardiness but also greater job satisfaction at the same time that they exhibited decreased anxiety, depression, and blood pressure (Maddi, 1987). In another intervention study, Maddi, Kahn, and Maddi (1998) showed that measures of hardiness and stress reduction were higher among those who undertook hardiness training than they were for those who underwent relaxation/meditation training and a placebo and social-support control. Through other studies, researchers suggested that hardiness is a feature of mental health. For example, hardiness is negatively related to self-reported

anxiety, depression, somatization, interpersonal sensitivity, and total score on the Hopkins Symptom Checklist (Maddi & Kobasa, 1984), depression on the Beck Depression Inventory (Funk & Houston, 1987; Hull et al., 1987), and other measures of depression, anxiety, neuroticism, and psychoticism (Ghorbani et al., 2000; Rarnanaiah & Sharpe, 1999). Furthermore, Maddi and Khoshaba (1994) found negative relationships between hardiness of undergraduates and the students' clinical MMPI scale (e.g., depression, hypochondriasis) scores; these relationships persisted even when negative affectivity was controlled. From these results, Maddi and Khoshaba (1994) suggested that hardiness is not merely negative affectivity or neuroticism. Researchers using additional tests and adult participants found similar results (Maddi, Khoshaba, Harvey, Lu, & Persico, 2002).

Are hardiness attitudes inborn or developed in individuals? In interviews conducted blind on IBT managers, those high in hardiness attitudes remembered having had a difficult early life in which they were identified as the family's hope, and they had accepted that role (Khoshaba & Maddi, 1999). These results suggested that hardiness attitudes can be learned and this was confirmed by the early form of hardiness training that was developed and tested at IBT (Maddi, 1987). Utilizing 15 weekly, group sessions, hardiness trainers instructed managers to cope transformationally with each of their stressors in turn and to use the feedback from their efforts to deepen their hardiness attitudes. Guided by the trainer, the group members provided social support and encouragement to their peers in their ongoing coping efforts.

In this first evaluation effort, Maddi (1987) compared the hardiness training group to a waiting-list of people trying to get into the IBT program (control group). In this comparison, Maddi found that the hardiness-training group showed a greater increase in hardiness attitudes, job satisfaction, and feelings of social support while exhibiting a greater decrease in anxiety, depression, suspiciousness, and blood pressure than their peers who had received no hardiness training. When the waiting-list control group was subsequently trained, Maddi found the same pattern of hardiness, job satisfaction, and signs of stressor decrease as in the first experimental group. In 6-month follow-up testing, the increased hardiness persisted for both groups.

In the second evaluation study, Maddi, Kahn, and Maddi (1998) compared hardiness training in effectiveness to a standard relaxation procedure, and a

placebo and a social-support control procedure. All trainers conducted all three procedures and showed no differences in competence. In contrast to those who experienced the two comparison procedures, those in hardiness training showed the greatest increase in hardiness attitudes and job satisfaction and the greatest decrease in anxiety, depression, and suspiciousness. Because the results of the relaxation and social support procedures varied from each other, one can argue that they had some effect in helping managers cope, but neither was as powerful as hardiness training.

To respond to the growing interest in practical applications of hardiness, facilitators of the current hardiness approach emphasize not only the coping and social support components, but also a self-care component of relaxation, nutrition, and exercise (Khoshaba & Maddi, 2001). In all components, the trainer emphasizes the use of the feedback obtained through exercising hardiness skills to deepen participants' hardiness attitudes. Through the hardiness-training regimen, the trainer retains a format of weekly, group sessions, but alternative formats and various combinations of components can also produce effective results.

We evaluated the effectiveness of hardiness training, specifically the coping and social support components that are offered as a regular credit course at Utah Valley State College in Orem, Utah. The community-college students taking the course were considered at high risk for poor college performance. We hypothesized that hardiness training would lead to increased GPA and retention among the participants.

Method

Participants and Groups

Forty students participated in the hardiness-training (experimental) group. All students met one or more U.S. Department of Education criteria for being at high risk of college performance deficits: showing a history of deficits in reading, writing, or mathematics; first-generation immigrant status; having no role model at home with a college degree; being a member of a minority group; and having a disability. The students voluntarily registered for the two-credit hardiness-training course after having had it described to them by their academic advisors. Two fall-semester classes of the course were offered. Each met for 1-hour sessions, twice a week. One course offering was taught by a male and the other by a female; both used identical syllabi. Both teachers had been trained in administering the hardiness approach.

They covered the coping and social-support components of hardiness training. They showed students how to use the feedback garnered from exercising coping and social-support skills to deepen hardiness attitudes. The instructors used the first volume of the *HardiTraining* workbook (Khoshaba & Maddi, 2001) as the textbook. This workbook includes narratives on hardiness, inspirational examples, exercises, and periodic checkpoints. On the basis of their performances in exercise completion and quizzes, students received a final grade in the hardiness-training course.

Per the guidelines put forth in the *HardiTraining* workbook (Khoshaba & Maddi, 2001), the trainer involves the student in problem solving with regard to each identified stressor. To encourage coping responses, the trainer directs the student to engage in situational reconstruction, an imagination procedure designed to give the participant a mental advantage by putting the stressor in a broader perspective and deepening one's understanding of it. Once perspective has been broadened and understanding deepened, the student is helped to develop a decisive plan of action, to carry it out, and to use the feedback from these efforts to deepen the hardiness attitudes. If situational reconstruction does not facilitate broadened perspective, deepened understanding, and decisive action, the difficulty may be that the student is suppressing strong negative emotions raised by the stress in a way that stifles imagination. To check out this possibility, the trainer directs the trainee to engage in focusing, a procedure for reflecting on signs of emotional upset in one's body (e.g., chest tension, stomach upset). If the student obtains emotional insights through focusing, this will free up the imagination necessary for obtaining broader perspective and deeper understanding, and then she or he can progress to the action and feedback stages of hardiness training. If neither situational reconstruction nor focusing works, the trainee can conclude that he or she has encountered an unchangeable situation. The trainer then shifts emphasis to compensatory self-improvement, through which the student protects hardiness by avoiding self-pity and bitterness by performing situational reconstruction and (or) focusing on a related stressor. In the social support component of hardiness training (Khoshaba & Maddi, 2001), the trainee evaluates and improves as necessary the effectiveness of his or her interactional network with significant others. Through an exercise that pinpoints existing social conflicts, the individual proceeds to try to resolve them through coping procedures and to replace them

with a mutual pattern of giving and getting assistance and encouragement. Throughout this process, the student obtains feedback that deepens her or his hardiness attitudes.

For comparison purposes, we chose 53 students to partake in the student enrichment (control) group. These participants, each of whom met one or more of the U. S. Department of Education defined at-risk criteria, registered of their own volition in one of two fall-semester student-enrichment courses. One of these courses, in which time management, study skills, and remedial work were emphasized, was taught by the male teacher who also taught the hardiness course. The other enrichment course, in which leadership training (Covey, 1989) was emphasized, was taught by the hardiness-course female instructor. These two-credit courses were held for the same number of hours and weeks as was the hardiness course, and students received grades based on their performances. Because we found no mean differences between these two courses (assessed by *t* tests in which statistical significance level was determined as $p \leq 0.05$) on any of the dependent variables used in this study, we could effectively combine the student enrichment classes into one control group for comparison with the hardiness-training group.

Hardiness Measures

In the first and last session of each course, we administered the *HardiSurvey III-R* (Maddi & Khoshaba, 1999), a 65-item questionnaire, to participants in the hardiness training and student enrichment groups. Composed of 4-point Likert items, this survey includes a current version of the hardiness attitude measure, along with scales of stress, strain, transformational coping (treating stresses as problems to be solved), regressive coping (denying and avoiding stresses), family social support, and work/school social support. Furthermore, the scale scores for stress, strain, and regressive coping are combined into a vulnerability index, and those for hardiness attitudes, transformational coping, and both family and work/school support form a resistance index. Finally, the vulnerability and resistance scores are combined into an overall wellness index. Norms for these various scores are based on approximately 3,000 test protocols on people varying in age, gender, school and work characteristics, and other demographic factors (Maddi & Khoshaba, 1999).

Academic Achievement and Demographic Measures

We obtained retention and GPA data for control-

and experimental-group participants when they registered for any of the training courses and 1 year later. In calculating retention, we did not consider graduation as dropping out of school. We also obtained demographic information and the number of credit hours that had been successfully completed at Utah Valley State College by each student at the time of their enrollment in any of the courses included in our study.

Results

Demographic and performance comparisons between the hardiness training and student enrichment groups prior to course training appear in Table 1. As in all comparisons in this study, we used two-tailed *t* tests and significance based on $p \leq 0.05$. We found no between-group differences in gender, age, ethnicity, marital status, parents with a college degree, GPA, college credits completed at Utah Valley State College, or previously identified deficits in reading, writing, and mathematics. Both groups were predominantly Caucasian, unmarried, in the 20-year age range, and documented a problem with mathematics performance. To a lesser extent than with mathematics, both groups contained students with writing problems.

Training Effects on Hardiness Survey Variables

Table 2 shows the pre- and post-training results of the *HardiSurvey III-R* for the hardiness training group. As we expected, those in this experimental group showed decreased stress, strain, regressive coping, and a lower vulnerability index score and increased hardiness attitudes, transformational coping, work/school support, family support, and higher resistance and wellness indices scores.

The similar pre- and post-training comparisons for the student enrichment group are shown in Table 3. The participants showed little significant change on *HardiSurvey III-R* scores. The only exceptions are transformational coping, which increased and the total resistance and total vulnerability indices, which decreased.

The comparison of *HardiSurvey III-R* scores across the hardiness-training and student-enrichment groups is shown in Table 4. The hardiness training group showed a bigger decrease in strain and regressive coping and a bigger increase in hardiness attitudes, work support, resistance, and wellness indices than did the student enrichment group.

By comparing the mean pre- and post-training averages on the *HardiSurvey III-R* for the two teachers who conducted hardiness training in their classes, we evaluated their relative effectiveness.

Table 1 Pre-training demographic and performance comparison of hardiness training ($n = 40$) and student enrichment ($n = 53$) groups (%)

Variable	Group		t	P
	Hardiness Training	Student Enrichment		
Female	55	52	0.235	ns
Caucasian	95	98	0.577	ns
Unmarried	85	95	1.566	ns
No degreed parent	57	47	0.828	ns
Reading deficit	45	50	0.448	ns
Writing deficit	53	59	0.634	ns
Math deficit	65	73	0.859	ns
Mean age	26.13	22.24	0.235	ns
Mean GPA	3.13	3.01	0.856	ns
Prior college credits	23.79	18.33	1.490	ns

Table 2 Pre- and post-training comparisons on the *HardiSurvey*111-R for the hardiness-trained group ($N = 40$)

Scale	Pre-training		Post-training		t	P
	Mean	SD	Mean	SD		
Stress	8.38	2.50	7.23	2.53	2.73	.009
Strain	16.10	10.23	12.75	10.03	4.19	.000
Regressive coping	9.60	5.31	7.65	4.08	2.85	.007
Hardiness attitudes	57.60	8.21	63.78	8.59	5.50	.000
Hardiness coping	36.65	9.77	43.13	9.50	4.69	.000
Hardiness work support	12.38	3.07	13.78	3.77	2.10	.050
Hardiness social support	15.63	2.67	16.83	2.41	2.12	.050
Total vulnerability	15.48	11.83	11.25	5.68	2.52	.010
Total resistance	6.67	1.21	7.18	1.22	2.43	.020
Total wellness	0.58	0.34	0.85	0.48	5.14	.000

Only the stress score was significantly different between the two classes, indicating very comparable teacher effectiveness.

Training Effects on Academic Achievement Variables

One year after the completion of the courses, we compared the rates of retention and GPAs across the hardiness-training and student-enrichment groups. As shown in Table 6, those in the **hardiness-training** group achieved a greater increase in GPA in the year following training than did those in the **student-enrichment** group. This result is important because these two groups did not have significantly different pre-training GPA scores or college-credits completed (see Table 1). We found that those in hardiness training also were retained at a higher rate, but the results were not statistically significant by a two-tailed t test. If recalculated with a one-tailed t test, which can be justified for a hypothesis, the retention data are statistically significant at the $p \leq 0.05$ level. At Utah Valley State College, during the period of this study, the average GPA for all

high-risk students was 2.85, and the retention rate was 44% (Hoyt, 1999). These statistics suggest that while student enrichment led to performance consistent with school norms, hardiness training generated improvement in these two important performance criteria.

Discussion

Through our study of high-risk undergraduates, we show that hardiness training decreased the vulnerability variables of stress, strain, and regressive coping, and it increased the resistance variables of hardiness attitudes and transformational coping. In other words, students learned the courage, motivation, and skills to solve (rather than deny and avoid) the problems impinging on them so that they experienced less disruptive stress and strain reactions. Accordingly, for hardiness-trained students, total vulnerability decreased, while total resistance and wellness index scores increased. In contrast, those in the student-enrichment courses showed fewer and more mixed results, with a simultaneous

Table 3 Pre- and post-training comparisons on the *HardiSurvey 111-R* for the student enrichment group (N = 53)

Scale	Pre-training		Post-training		<i>t</i>	<i>P</i>
	Mean	SD	Mean	SD		
Stress	7.62	3.21	7.47	3.71	0.39	ns
Strain	11.13	9.13	10.45	8.46	0.86	ns
Regressive coping	9.81	5.29	9.98	6.46	0.17	ns
Hardiness attitudes	59.89	7.24	61.23	8.13	1.36	ns
Hardiness coping	36.13	6.46	40.38	9.22	3.29	.002
Hardiness work support	13.64	3.02	14.00	3.70	0.63	ns
Hardiness social support	15.77	3.15	15.40	3.19	1.02	ns
Total vulnerability	16.51	16.18	11.83	5.49	2.24	.03
Total resistance	8.91	6.91	6.87	1.19	2.11	.04
Total wellness	0.74	0.42	0.79	0.49	1.10	ns

Table 4 Comparison of pre-training and post-training on *HardiSurvey 111-R* scores between hardiness trained (n = 40) and student enrichment (n = 53) groups

Scale	Hardiness Trained		Control		<i>t</i>	<i>P</i>
	Mean	SD	Mean	SD		
Stress	1.15	2.67	0.15	2.81	1.74	ns
Strain	3.35	5.06	0.68	5.75	2.33	.02
Regressive coping	1.95	4.33	-0.13	5.68	1.93	.05
Hardiness attitudes	-6.18	7.10	-1.34	7.15	3.24	.002
Hardiness coping	-6.48	8.73	-4.25	9.39	1.17	ns
Hardiness work support	-1.35	3.82	-0.36	4.11	1.98	.05
Hardiness social support	-0.80	2.62	0.38	2.70	1.51	ns
Total vulnerability	4.23	10.59	4.68	15.20	0.16	ns
Total resistance	-0.50	1.30	2.08	7.01	2.26	.02
Total wellness	-0.27	0.33	-0.06	0.41	2.61	.01

Note. On each scale, we subtracted each participant's post-training score from his or her pre-training score. We averaged the resulting difference within training groups, and we compared these means between the hardiness-trained and student-enrichment groups. Positive and negative values reflect a decrease or an increase, respectively, in the scale score.

decrease in both total vulnerability and total resistance. When we compared the student enrichment group and the hardiness-training group, we found that the latter showed lower strain and regressive coping and higher hardiness attitudes, work support, total resistance, and total wellness scores.

The students in the enrichment group were introduced to standard remedial approaches, such as time management and study skills, or leadership training (Covey, 1989). These enrichment approaches could be expected to improve the attitudinal outlook and coping efforts of students exposed to them. However, hardiness training generated a stronger, more comprehensive effect. The results are particularly noteworthy because we controlled for teacher effectiveness by having the same instructors facilitate both the hardiness-training and student-enrichment courses. Therefore, we suggest that those

concerned with student performance consider the inclusion of hardiness training into their curricula.

One could argue that the greater improvement in attitudes and skills by hardiness-trained participants was merely the result of students learning the appropriate answers for the *HardiSurvey 111-R* questions. After all, by the time the students completed the posttest, they knew more about hardiness than they did during the pretest. In contrast, the students in the enrichment group may have known little more about hardiness at the end of their course than they did at the beginning, and therefore the test reveals little change in attitude.

If the results solely reflected knowledge gained on how to answer the *HardiSurvey 111-R* items, one would not expect group differences in GPA or retention. But, despite the nearly identical demographics and risk status of students in both groups,

Table 5 Relative effectiveness of instructor A ($n = 20$) and instructor B ($n = 20$) in conducting hardiness training

Scale	Teacher A		Teacher B		<i>t</i>	P
	Mean	SD	Mean	SD		
Stress	0.35	2.74	1.95	2.39	1.97	.057
Strain	4.40	6.00	2.30	3.77	1.33	ns
Regressive coping	2.65	4.28	1.25	4.38	1.02	ns
Hardiness attitudes	-6.20	6.57	-6.15	7.75	0.02	ns
Hardiness coping	4.20	7.42	-8.75	9.50	1.69	ns
Hardiness work support	-0.10	3.86	-0.70	3.85	0.49	ns
Hardiness social support	-0.30	2.15	-0.10	3.08	0.24	ns
Total vulnerability	6.15	14.53	2.30	3.34	1.16	ns
Total resistance	-0.35	1.42	-0.65	1.18	0.73	ns
Total wellness	-0.30	0.38	-0.24	0.27	0.61	ns

Note. On each scale, we subtracted each participant's post-training score from his or her pre-training score. We averaged the resulting difference scores for Trainers A and B, and we compared these means. Positive and negative values indicate a decrease or an increase, respectively, in the scale score.

Table 6 Changes in retention and GPA in the hardiness-trained ($n = 40$) and student-enrichment ($n = 53$) groups

Variable	Hardiness Trained Group	Student Enrichment Group	<i>t</i>	<i>p</i>
Mean GPA 1 Year After Course	3.06	2.75	2.21	.02
Retention Rate 1 Year After Course	73%	55%	1.68	.09

Note. We calculated each student's GPA for all courses taken up to the semester when she or he registered for the hardiness training or student enrichment course, and then again for the year after they completed the respective course. We also calculated the average number of students who remained in college 1 year after they completed the hardiness training or student enrichment course. Students who graduated successfully in the year subsequent to the course were counted as retained.

those in the hardiness-training group showed a higher GPA in the year following the course than did the students in the enrichment group. Also in this time period, retention tended to be higher among the hardiness-trained students than among those who took the enrichment courses; although the difference was not statistically significant when tested by a two-tailed *t* test, it was significant when tested by a one-tailed *t* test ($p \leq 0.05$). In addition, the findings by Lifton et al. (2000) suggest that the effects of hardiness attitudes on retention may not emerge after only 1 year. They found a positive relationship between naturally occurring hardiness attitudes and subsequent retention only after 2 years. Most likely, attrition is the result of many ongoing stresses that are unresolved and accumulate because they are not buffered by high hardiness. In summary, based on our results concerning GPA and retention, we suggest that the effect of hardiness training is genuine in influencing attitudes and skills that improve performance; we contend that students in hardiness

training were equipped with real and longstanding courage and skills and were not just subject to information that enabled them to earn high scores on the *HardiSurvey* 111-R.

We found that students who went through hardiness training did not improve in social support in their private lives, although they did show improvement in work relationships. Because similar test scales have proven valid in other circumstances (Moos, Insel, & Humphrey, 1974), this result is probably not a function of poor measurement of family social support by the *HardiSurvey* 111-R. One must recognize that most social relationships are complex and cannot be changed over the course of a semester. Although the hardiness-trained student may learn much about improving relationships, the process cannot be successfully completed unilaterally: Multiple people and a history of the relationship affect the success of future interactions, and the hardiness-trained individual may need some time to bring the process to fruition. As

with the retention data, we suggest that further studies on the social effects of hardiness training be carried out over longer periods.

Certainly, additional studies are needed to evaluate the nature and extent of hardiness-training usefulness in a college setting. At this time, hardiness training is being offered as a regular course at several postsecondary institutions, and research data are being collected. If the findings from these data confirm those of this study, hardiness training will emerge as a powerful tool to help high-risk students, and perhaps others as well, to be successful in college and prepare for an effective life.

On the basis of this and other studies, hardiness assessment and training may be useful tools for college advisors in their attempts to help poorly performing students. Most at-risk students can benefit from the many services available at most colleges; however, advisors need a comprehensive way of identifying these students early in their academic careers. As indicated by this study and also that of Lifton et al. (2000), who found that naturally occurring hardiness is a better predictor of retention than were either SAT scores or high school rank, we believe that the *HardiSurvey 111-R* can be useful. The 65-item survey can be completed on a hardcopy or over the Internet in less than 20 minutes.

After the students have completed the *HardiSurvey 111-R*, they and their advisors receive a comprehensive report on various stress-vulnerability and resistance factors and recommendations for hardiness training. For students who need help, hardiness training, either as a credit course along with other student enrichment options, or through individual or group counseling, may be a beneficial service. Advisors interested in pursuing hardiness training can point administrators to the results of this study, along with those of other research efforts (Maddi, 1987; Maddi, Kahn, & Maddi, 1998), to show that improved performance and possibly increased retention can be expected through hardiness training. In addition, advisors or select faculty members can be trained on-site to facilitate the one-semester hardiness course.

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