Sex differences in hardiness and health among West Point cadets*

Paul T. Bartone & Robert F. Priest
United States Military Academy
West Point, New York 10996
USA

ABSTRACT: The U.S. Military Academy at West Point places young men and women in a highly demanding world of extreme mental and physical challenges. As such, it provides an excellent natural laboratory in which to study how people respond and adapt to highly stressful conditions. The present study explores the role of personality hardiness as a stress-resistance resource for male and female freshmen cadets at West Point. Previous studies with cadets show that in general, female cadets report higher stress levels than male cadets across several domains. This raises the possibility that, given the recognized role of hardiness as a stress moderator, hardiness may be a more salient resiliency tool for females than it is for males. The present study tests this hypothesis, examining within sex groups the relation of hardiness to health and performance indicators, as well as hardiness as a stress moderator. A survey instrument was used to assess hardiness, symptoms, illness behaviors, and perceived stress/demands in N=234 students. Results show that hardiness predicts symptoms, but not illness behaviors overall. As hypothesized, female cadets (N=72) are significantly higher in hardiness than males (N=162), although females also report more health problems than males. Female cadets also perceive the performance requirements across several domains as more demanding than do male cadets. Multivariate analyses within sex groups will determine if higher hardiness levels among the female cadets serves a protective function.

INTRODUCTION: The present study explores the role of personality hardiness as a stress-resistance resource in Army officer cadets. The U.S. Military Academy at West Point places officer cadets in a world of extreme mental and physical challenges. This provides an excellent natural laboratory in which to study how people respond and adapt to highly stressful conditions. Given the recognized stressfulness of the four-year West Point cadet experience, as well as the highly ambiguous and stressful operational environments which cadets will enter as junior Army officers, military psychologists should devote more research toward identifying potential stress resiliency factors for cadets and young officers.

Previous research has shown that personality hardiness provides a protective advantage to those who have it. Conceptually, hardiness involves a high sense of commitment to life and work, a strong belief in one's ability to control events and influence outcomes, and greater openness to change and challenges in life (Maddi & Kobasa, 1985). Persons high in hardiness are more resilient when exposed to a range of environmental stressors, remaining healthy and performing well despite high stress levels. Those low in hardiness, on the other hand, tend to become ill and suffer performance breakdowns under stress. The possibility of sex differences in hardiness, and in how

*Presented at the 13th Annual Convention of the American Psychological Society, Toronto, 14-17 June 2001.

e-mail: bartonep@gmail.com

hardiness might function as a stress moderator, remains relatively unexplored. Previous studies with cadets show that in general, female cadets report higher stress levels than male cadets across several domains (Belmont, 2000), and that hardiness predicts military performance for female cadets (Bartone & Snook, 2000). This raises the possibility that, given the recognized role of hardiness as a stress moderator, hardiness may be a more salient resiliency tool for females than it is for males. The present study tests this hypothesis, examining the relation of hardiness to health and performance indicators within sex groups.

METHODS: A survey instrument was used to assess hardiness, symptoms, illness behaviors, and perceived stress/demands in several different domains (academic, military, physical, family life, social life, time/schedule, and overall/life in general) for freshman cadets at West Point (instruments available upon request from author). All participants (N=234) volunteered for the research as part of their Introductory Psychology course. Female cadets currently make up about 17% of the student population at West Point. Females were over-sampled for this study in order to provide more balanced comparison groups. The sampling strategy resulted in N=72 females (31%) and N=162 (69%) males for this study. Once the survey data collection was complete, official academy records were consulted to obtain Military Performance Grades for all participants, based on their 1st semester of freshman year. These grades reflect the combined ratings of several supervisors who have evaluated the cadet's performance as a military leader.

RESULTS: As predicted, female cadets (N=72) were found to be higher than males (N=162) in hardiness ($t=2.01$, $p< .05$) and symptoms ($t=3.17$, $p<.002$). Female cadets also reported significantly higher levels of stress in several domains: (1) Military, (2) Physical, (3) Time/schedule, and (4) Overall – Life in general.

Next, the correlations of hardiness to Military Grades and symptoms were examined, for the total group and within sex groups. Further, in order to explore the potential role of hardiness as a stress resiliency factor, the correlations were also computed within "low-stress" and "high-stress" groups. In theory, if hardiness functions as a stress resiliency factor, the association between hardiness and relevant outcome indicators (health and performance) should be stronger under high-stress conditions. Table 1 shows the correlations between hardiness and (a) military grades; (b) symptoms for groups broken down by sex and high or low stress groups. High and low stress groups were established by summing responses to the seven stress items, and performing a median split based on this overall stress measure.

As expected, hardiness correlates negatively with symptoms, and this relation appears fairly consistent regardless of sex or high / low stress condition. Hardiness also correlates with Military performance grades for the total group, and for men, but not for women in this sample. The strongest correlations between hardiness and symptoms appear under the high stress condition, as predicted, and this correlation is highest ($r = -.54$***) for women. Hardiness correlates positively with military performance for men under the low stress condition. Curiously, hardiness correlates positively with symptoms for women under the high-stress condition ($r = .39$, $p < .05$).

Table 1
Correlations of hardiness with Military Grade & Symptoms for Low & High Stress (total stress / demands) groups

	Low stress (N=117)	High stress (N=116)	Total (N=233)
Men MD grade	.34***	-.02	.18*
Symptoms	-.26**	-.35**	-.29***
	(92)	(69)	(161)
Women MD grade	.15	.06	-.09
Symptoms	.39*	-.54***	-.25*
	(25)	(47)	(72)
Total MD grade	.27**	.02	.16**
Symptoms	-.13*	-.38***	-.25***
	(117)	(116)	(233)

* = p < .05; ** = p < .01; *** = p < .001 number in parenthesis is the N on which correlation coefficient is based.

A similar approach divides the sample into high and low hardiness groups, and evaluates the correlations of stress with health and performance indicators within hardiness and gender groups. In theory, the correlations of stressors with health and performance should be higher in the low-hardy groups, since high hardiness is hypothesized to protect against the ill-effects of stress. If hardiness is a more salient stress-resistance resource for women, correlations between stress and illness should be highest for low-hardy women. As can be seen in Table 2, this prediction is supported. Low-hardy women (N=30) show the highest correlation (r= .52, p < .01) of any group between overall stress and symptoms.

Table 2
Correlations of overall stress with Military Grade & Symptoms for Low & High Stress (total stress / demands) groups

	High hardy (N=115)	Low hardy (N=118)	Total (N=233)
Men MD grade	.10	.01	.03
Symptoms	.06	-.07	.02
	(73)	(88)	(161)
Women MD grade	-.33*	.19	-.15
Symptoms	-.04	.52**	.19
	(42)	(30)	(72)
Total MD grade	-.05	.05	-.01
Symptoms	.08	.06	.09
	(115)	(118)	(233)

* = p < .05; ** = p < .01; *** = p < .001 number in parenthesis is the N on which correlation coefficient is based.

DISCUSSION / CONCLUSIONS: It was predicted that hardiness would correlate with military performance and health indicators more strongly under high stress conditions. The general pattern of correlations supports this prediction. Somewhat surprisingly, hardiness correlates r = .34*** with Military performance grades for men, under the low stress condition. One possible explanation for this finding is that there may be a sub-group of male cadets who are not only low in hardiness, but also somewhat alienated and low in motivation. These cadets may report low stress or demands because they are largely unaffected by the requirements of the institution around them. A very different, better adjusted sub-group of male cadets might also report low stress, because they are functioning well and coping effectively with the many institutional demands of West Point. They are also higher in hardiness. These highly motivated and high hardiness cadets would perform better, and achieve higher military grades, while their poorly motivated counterparts would earn grades that reflect their poor performance. This dynamic could account for the high correlation between hardiness and military grades among low-stress male cadets. Future research should evaluate this possibility, by looking more closely at both male and female cadets and following them over time. The low-stress, low-hardy, low performance cadets may also be at higher risk for early attrition from the academy.

Several conclusions can be drawn from this research. First, we have confirmed that female cadets at the U.S. Military Academy experience higher levels of stress and symptoms than their male counterparts, but females are also higher in hardiness. For all groups, hardiness is associated with better health (fewer symptoms). Hardiness is also associated with higher military performance for cadets, though this appears more true for males than females. The pattern of correlations within sex- and low/high stress groups lends some support to the hypothesis that hardiness functions as a stress moderator; for men, the resiliency effect seems to be with respect to performance outcomes, while for women, it is with respect to health outcomes.

Additional research should explore these relations further, preferably with a larger sample of female cadets to support more fine-grained and multivariate analyses. If female cadets are generally higher in hardiness than males, perhaps as a result of some self-selection process, than a problem of restricted-range in hardiness might serve to mask an actual stress-resiliency function of hardiness for females. A similar restricted-range problem could affect stress measures in a uniformly stressful institutional environment such as West Point. With respect to female cadets in particular, if most are high in hardiness, while also experiencing high levels of demands or stress, hardiness may be functioning as a stress resiliency factor or coping tool for the entire female cadet population. If this is so, only main effects would be apparent, and interaction effects (e.g., hardiness X stress) would not be seen. Future work will explore this possibility, and also expand the health and performance indicators to include a longer time period of reference and additional performance measures (e.g., academic performance; attrition). Results could lead to substantially improved selection and training strategies for future military officers.

References

Bartone, P.T. & Snook, S.A. (June, 2000). Gender differences in predictors of leader performance over time. Presented at the Annual Meeting of American Psychological Society, Miami Beach, Florida.

Belmont, K. (May, 2000). Stress, coping, and disturbed eating behaviors at the U.S. Military Academy. Senior Research Project in Psychology. West Point, New York: Department of Behavioral Sciences and Leadership, U.S. Military Academy.

Maddi, S.R. & Kobasa, S. (1984). The hardy executive: Health under stress. Homewood, IL: Dow Jones-Irwin.