Development and Validation of a Short Hardiness Measure

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Note: The views of the author do not necessarily reflect the positions of the Department of the Army or the Department of Defense (para. 4-3, AR 360-5).

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ABSTRACT

Personality "hardiness" has been empirically demonstrated as an effective moderator in the stress-illness relation, across a wide variety of samples. Unfortunately, the measurement of this disposition has not progressed beyond the original collection of scales first used by Kobasa in her seminal 1979 work. The present paper describes the development and validation of a short (30-item) hardiness scale now in use in the U.S. Army. Evidence for the convergent, discriminant, and predictive validity of the instrument is presented, along with norms for both men and women, internal consistency and test-retest reliability coefficients.
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The personality disposition of "hardiness" has been found to be a promising variable that seems to influence the relation between psychosocial stress and health outcomes in a variety of samples. Unfortunately, progress in assessing hardiness has not kept pace with interest in the construct. Studies are still being published (e.g., Contrada, 1989; Roth et. al, 1989; Wiebe, 1991) that rely on the original, and in various ways problematic items first reported by Kobasa in her seminal (1979) work. This original measure is an amalgam of items from the California Life Goals Evaluation Schedule (Hahn, 1966), the Personality Research Form (Jackson, 1974), the Locus-of-Control Scale (Rotter et. al., 1962), and the Alienation Test (Maddi, Kobasa, & Hoover, 1979). Even worse, some investigators are defining their own hardiness "measures", usually without determining validity and reliability (e.g., Kuo & Tsai, 1986). Problems with the original items include the fact that they are all negatively worded, such that endorsement represents a "non-hardy" response. This may leave the scale more vulnerable to social desirability response set, and possible confounding with neuroticism or maladjustment. Factor analyses also have not always supported the existence of three distinct sub-dimensions of hardiness, commitment, control, and challenge. These difficulties have led to criticisms of both the measurement and conceptualization of
hardiness (Funk & Houston, 1987). What is needed is an improved measure that is grounded conceptually in the original work on the hardiness construct, but that corrects the psychometric limitations of the earlier measure(s).

This paper presents information on a short, 30-item hardiness scale currently in use in studies of military personnel. This scale had its beginning in 1982, when a planned study of stress and health in Chicago bus drivers spurred efforts to revise the hardiness measure to make it more appropriate for blue collar workers, as well as correct other recognized problems with the scale (Bartone, 1984). Using data on a group of 190 lower-level managers at a large Illinois utility, item frequencies and item-scale correlations were examined for the 53 security, alienation from work and self, and powerlessness items then in use. Eighteen items were eliminated based on very weak correlations with their own scales (less than items, 10 security, 8 alienation from work, 7 alienation from self, and 10 powerlessness. A slightly modified version of the Nowicki & Strickland (1973) locus of control scale (20 items) was substituted for the longer and more cumbersome Rotter measure (29 pairs of forced-choice items). Finally, a research group at the University of Chicago collaborated in writing 21 new items, mostly to tap the hardiness dimension of security/challenge.1 When the data on bus drivers (N=787) became available, this refined 76-item hardiness scale was further reduced to 50-items through item-scale correlation...
procedures and reliability analysis (Bartone, 1984). This scale consisted of 20 commitment items, 20 control items, and 10 challenge items.

Further analyses were later undertaken in order to derive a hardiness measure with an equal number of commitment, control, and challenge items. Using a variety of techniques including item-scale correlation, reliability analysis, and factor analysis, and examining data from both bus driver and lower-level executives samples, the "best" 45 items were selected, 15 each for the hardiness sub-scales of commitment, control, and challenge. This 45-item hardiness measure contains positive as well as negative items, and is scored to yield a "positive indicator" of hardiness. It correlates -.71 with non-overlapping items from the original hardiness measure (alienation, powerlessness, security) in the bus driver sample (N=791), and was found to discriminate Army disaster assistance workers who remain healthy from those reporting stress-related symptoms over time (Bartone et. al., 1989).

Continued use of this measure has led to a shortened 30-item version, with ten items each measuring commitment, control, and challenge (Bartone et. al., 1989). This short form has the additional virtue of being fully balanced for positive and negative items, with an equal number (15) of each. The correlation between the 30-item form and 27 items of the
original hardiness scale (6 alienation from self, 2 alienation from work, 7 powerlessness, 10 security, 2 cognitive structure) is -0.74 (bus driver sample, N=753). Scores on the short form have demonstrated appropriate correlations with theoretically related (convergent) and unrelated (discriminant) variables, and are generally predictive of continued mental and physical health under a variety of social stressors (e.g., Bartone et al., 1989; Bartone, 1989). The six-month stability coefficient is personnel workers). Cronbach's alpha for the total scale ranges from 0.70 to 0.85 depending on the sample. While reliability analyses and factor analyses with various samples generally support the utility of the 3 sub-dimensions, internal consistency for the challenge scale is low (0.35 - 0.62). Though it is useful conceptually to consider how the hardiness construct is composed, it is probably best empirically to operate only with total hardiness scores.

Another difficulty with the older hardiness measure was related to the fact that a different number of items comprised each of the 3 sub-scales. Since a balanced total score was desired, with an equal contribution from commitment, control, and challenge, the original investigators applied the strategy of converting raw scale scores to standardized Z scores before summing them for a total hardiness score (Kobasa, Maddi & Courington, 1981; Kobasa, Maddi & Kahn, 1982). Unfortunately, this precludes the comparing of hardiness scores across samples,
since standard scores are adjusted to each sample mean and standard deviation. By definition, samples are identical in hardiness when means are computed in this way. Other investigators have commented on the problems created by this approach (Roth et. al, 1989). The present 30-item scale avoids this difficulty by including 10 items each to measure the sub-dimensions of commitment, control, and challenge. This permits the use of raw scale scores, and the comparison of scores across samples and studies.

Table 1 provides norms on the short hardiness scale for a variety of military samples, as well as a group of college undergraduates. These will serve as reference points for other investigators wishing to use this measure. Table 2 is reproduced from a report on "Hardiness, optimism, and health: A construct validity study (Bartone, 1989). It shows the correlations of hardiness scores with characteristic optimism (Scheier & Carver, 1985), and several measures of health and well-being in a military sample (N=262). Measures include general well-being (GWB), negative affect, positive affect, total psychological well-being, psychiatric symptoms, doctor visits in the past year, reported recent illness, general health, and illness "profile" that indicates serious injury such as a broken leg. Additional pages list the items themselves, and the programming code for generating scale scores using SAS or SPSS-X systems.
<table>
<thead>
<tr>
<th>Sample Description</th>
<th>Total Hardiness</th>
<th>Commitment</th>
<th>Control</th>
<th>Challenge</th>
<th>Sample Size</th>
<th>Additional Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>N=293 male Army Special Forces course graduates (1992, unpub.)</td>
<td>67.04</td>
<td>24.56</td>
<td>23.44</td>
<td>19.03</td>
<td>N=293</td>
<td></td>
</tr>
<tr>
<td>N=8,546 male Army soldiers deployed to Gulf War (Bartone et. al., 1992)</td>
<td>54.32</td>
<td>17.67</td>
<td>20.53</td>
<td>16.22</td>
<td>N=8,546</td>
<td></td>
</tr>
<tr>
<td>N=455 male Army soldiers not deployed to Gulf War (Bartone et. al., 1992)</td>
<td>54.15</td>
<td>17.91</td>
<td>20.25</td>
<td>16.10</td>
<td>N=455</td>
<td></td>
</tr>
<tr>
<td>N=8,229 male Army soldiers, all ranks; Vaitkus &amp; Griffith, 1990</td>
<td>57.17</td>
<td>18.26</td>
<td>21.75</td>
<td>17.15</td>
<td>N=8,229</td>
<td></td>
</tr>
<tr>
<td>N=353 Alaska-based &quot;cohort&quot; soldiers; Bartone, 1989</td>
<td>60.03</td>
<td>20.76</td>
<td>22.82</td>
<td>16.48</td>
<td>N=353</td>
<td></td>
</tr>
<tr>
<td>N=1,642 male Army soldiers, all ranks; Bartone &amp; Schneider (B/S) 1989</td>
<td>52.62</td>
<td>17.34</td>
<td>19.82</td>
<td>15.67</td>
<td>N=1,642</td>
<td></td>
</tr>
<tr>
<td>N=1046 white Army soldiers, all ranks; B/S 1989</td>
<td>53.16</td>
<td>17.27</td>
<td>19.83</td>
<td>16.05</td>
<td>N=1046</td>
<td></td>
</tr>
<tr>
<td>N=381 black Army soldiers, all ranks; B/S 1989</td>
<td>52.44</td>
<td>17.86</td>
<td>19.53</td>
<td>15.02</td>
<td>N=381</td>
<td></td>
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<tr>
<td>N=337 male Army officers &amp; leaders (E6+); B/S 1989</td>
<td>58.75</td>
<td>20.82</td>
<td>21.75</td>
<td>16.19</td>
<td>N=337</td>
<td></td>
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<tr>
<td>N=191 Army Casualty Assistance Officers; Bartone et. al., 1991</td>
<td>60.81</td>
<td>22.23</td>
<td>21.87</td>
<td>16.93</td>
<td>N=191</td>
<td></td>
</tr>
<tr>
<td>N=45 Army Casualty Center Workers3</td>
<td>59.84</td>
<td>22.22</td>
<td>21.50</td>
<td>16.60</td>
<td>N=45</td>
<td></td>
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<td>N=119 Army &quot;graves registration&quot; workers; Bartone</td>
<td>58.47</td>
<td>20.05</td>
<td>21.42</td>
<td>17.00</td>
<td>N=119</td>
<td></td>
</tr>
</tbody>
</table>

TABLE 1: Hardiness Scale Means and Standard Deviations for Available Samples (Mean/s.d.)
& McCarroll (B/M) 1990

TABLE 1 (continued): Hardiness Scale Means and Standard Deviations for Available Samples (Mean/s.d.)

<table>
<thead>
<tr>
<th>Total Hardiness</th>
<th>Commitment</th>
<th>Control</th>
<th>Challenge</th>
<th>Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>58.98</td>
<td>20.39</td>
<td>21.78</td>
<td>16.81</td>
<td>N=95 male &quot;graves registration&quot; workers; Bartone &amp; McCarroll, 1990</td>
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<tr>
<td>7.99</td>
<td>4.95</td>
<td>2.97</td>
<td>3.47</td>
<td>56.46</td>
</tr>
<tr>
<td>10.54</td>
<td>4.92</td>
<td>4.46</td>
<td>3.10</td>
<td>N=24 female &quot;graves registration&quot; workers; Bartone &amp; McCarroll, 1990</td>
</tr>
<tr>
<td>61.33</td>
<td>20.85</td>
<td>21.09</td>
<td>19.39</td>
<td>N=87 male college undergraduates; B/M 1990</td>
</tr>
<tr>
<td>6.55</td>
<td>3.81</td>
<td>2.62</td>
<td>3.06</td>
<td>61.83</td>
</tr>
<tr>
<td>6.28</td>
<td>3.53</td>
<td>2.46</td>
<td>3.14</td>
<td>N=77 female college undergraduates; B/M 1990</td>
</tr>
</tbody>
</table>

NOTES

1. This research team consisted of: Salvatore Maddi, Suzanne Kobasa, Mark Puccetti, Mark Zola, Bill Merrick, Paul Bartone, Hilla White, Mike Atella, Mel Schneider, Kathy Beisel, Ed Donner.

2. The 45-item version still contains more negatively keyed items (30) than positively keyed ones (15).

3. Work in progress examining stress, health and adjustment in male and female Army casualty operations personnel involved in Operation Desert Shield/Storm casualty activities; with Terry Fullerton, Walter Reed Army Medical Center. Submitted for presentation at APA, 1992, Washington, DC.
REFERENCES


