We examined the role of hardiness in predicting admission into Norwegian Military Officer Schools with data from officer applicants (N = 1,111) who completed a questionnaire containing dispositional hardiness measures (Bartone, 1995) on the first week of a three-week selection period. Successful applicants (M = 36.76) scored significantly higher in hardiness than unsuccessful applicants (M = 35.55, t[1091.44] = −4.64, p < .001, Cohen’s d = .28). Furthermore, results of logistic regression analysis showed that, after controlling for gender, age, and social desirability responding, hardiness significantly predicted admission into Military Officer Schools (odds ratio = 1.065).

Previous efforts to identify self-report psychological tests that predict success in military training and performance in Norway have met with limited success. Across two studies with Naval Special Forces candidates, Hartmann and colleagues (Hartmann & Grønnerød, 2009; Hartmann, Sunde, Kristensen, & Martinussen, 2003) concluded that none of the Big Five factors seemed to be good predictors of training performance. In another study focusing on Norwegian Naval and Army Academy cadets, Eid, Meland, Matthews, and Johnsen (2005) did find a relationship between dispositional optimism and situation awareness.
during a field training exercise. However, this relation was negative: high levels of optimism were associated with a decreasing ability to accurately perceive the situation at hand, to understand the meaning of what was perceived, and to project accurately what was likely to occur in the near future. On the other hand, a study of Norwegian Army and Air Force cadets found a positive relationship between personality factors and successful coping during stressful exercises (Sandal et al., 1998). Using endocrine parameters as indicators of physiological stress reactions, Sandal and colleagues found that cadets with a certain personality profile (the Positive Instrumental/Expressive cluster of the Personality Characteristic Inventory) exhibited larger testosterone-cortisol ratios relative to cadets with other profiles following a five-day exercise. Large testosterone-cortisol ratios, that is, high testosterone and low cortisol, were interpreted as signs of superior coping.

A promising personality dimension in relation to military training and performance is psychological hardiness. Hardiness is a personality style that has been associated with resilience and high performance under a range of stressful conditions in both civilian and military samples (Bartone, 1999; Kobasa, 1979; Maddi & Kobasa, 1984; Sheard, 2009). Conceptually, hardiness is characterized by a strong sense of commitment, control, and challenge (Bartone, 2000). People high in hardiness see the world as interesting and meaningful and are actively engaged in what is going on around them. They have a belief in their own ability to control or influence the course of events, perceive new experiences and challenges as exciting opportunities for learning and personal growth, and are internally motivated and create their own sense of purpose. The personality style of hardiness appears to be highly relevant for military training and selection. For instance, individuals high in hardiness tend to see new and challenging experiences as opportunities for personal growth and will actively seek out and pursue such opportunities. This tendency should not only increase their readiness to learn and develop from training, but also should make the person high in hardiness better equipped to cope with demanding and stressful events.

Hardiness has been researched extensively in numerous U.S. military groups with good results (e.g., Atwater, Dionne, Avolio, Camobreco, & Lau, 1999; Bartone, 1999; Bartone, Eid, Johnsen, Laberg, & Snook, 2009; Bartone, Ursano, Wright, & Ingraham, 1989). For instance, Bartone and associates (2009) studied a single class cohort at the U.S. Military Academy, West Point, and found that hardiness predicted military development grades aggregated over four years, after controlling for general intellectual abilities and the Big Five personality factors. In addition, Bartone, Roland, Picano, and Williams (2008) found that hardiness was able to predict successful completion of a selection course for U.S. Army Special Forces candidates.
While these findings point to hardiness as an important factor in military training and selection, one should not assume that they automatically generalize to other cultural contexts. Most hardiness research has been conducted on primarily U.S. participants, and it is therefore important to also study hardiness cross-culturally and try to replicate findings within different cultures. On the issue of cross-cultural validity, Maddi and Harvey (2006) conclude that available evidence shows little or no cultural differences in the role of hardiness and suggest that hardiness appears to be a factor in resilience under stress across cultures. Yet others have argued that hardiness is a cultural idiom of the U.S. and may not necessarily be relevant for other cultures (Riska, 2002).

For example, research on cultural value orientations has shown that American culture is especially high in mastery and low in egalitarianism compared with Scandinavian cultures (Schwartz, 2006). Mastery reflects an orientation that encourages assertive action in order to master, direct, and change the social environment, with important values such as ambition, competition, and hard work. Scandinavian cultures, on the other hand, tend to emphasize harmony and egalitarianism and prioritize values such as equality and social justice. It is quite possible that the characteristics that define hardiness may be more prevalent features of U.S. cultural value orientations than Norwegian or Scandinavian orientations.

Previous research within the Norwegian Armed Forces has, however, shown that psychological hardiness is a promising variable in relation to performance among Norwegian military personnel as well. For instance, Eid and Morgan (2006) explored hardiness, peritraumatic dissociation, and military performance in a sample of Navy cadets participating in a highly stressful simulated prisoner of war exercise. While the authors did not find a relationship between hardiness and expert ratings of performance, they did find that hardiness was associated with fewer symptoms of dissociation, which in turn predicted military performance. Two further studies of Norwegian Navy cadets have found hardiness to be associated with increases in both self-rated and peer-rated transformational leadership style following a weeklong training exercise and field simulation (Eid, Johnsen, Bartone, & Nissestad, 2008; Johnsen, Eid, Pallesen, Bartone, & Nissestad, 2009). These results may indicate that individuals high in hardiness are better prepared and more successful in utilizing their training to develop as leaders.

The purpose of the present study is to evaluate psychological hardiness as a potential predictor of admission into Norwegian Military Officer Schools. Based on the research and findings presented above we propose that:

Hypothesis 1. Hardiness would be positively related to admission into Norwegian Military Officer Schools.
METHOD

Participants and Procedures

Each year the Norwegian Armed Forces conducts a 3-week selection course for applicants to Military Officer School training programs. The first week is used to administer entrance tests, medical and psychological examinations, physical strength tests, and interviews with officers and psychologists. The second week includes a week-long field exercise designed to assess aptitude for military officer training, cooperation and leadership ability, and will to acquire the necessary practical and military knowledge. The third week consists of final testing and evaluation, wherein staff responsible for the selection process submit recommendations to admit/reject individual applicants. Individuals can be dismissed at any point during the three-week selection course if they fail to meet any requirements, and applicants must successfully complete week 1 before advancing to weeks 2 to 3 of the selection process.

Data were collected in multiple sessions over a two-day period during the first week of the Joint Admission and Selection (JAS) course organized by the Norwegian Armed Forces in the summer of 2009. Groups of approximately 20 to 40 applicants at a time were greeted by the researchers responsible for the study and given a short briefing about the nature and purpose of the study. Applicants who agreed to participate gave their informed consent and proceeded to complete electronic versions of the scales described below. When the selection process was completed and all admission decisions were made, hardiness and social desirability data were matched with intake data by a person working for the JAS/Armed Forces, not associated with the current research project. Data from 1,111 officer applicants (963 men and 148 women) were obtained for the study. The mean age for the sample was 19.4 (SD = 1.8) and ranged from 17 to 34—no other demographic information was collected as part of the study.

Measures

Hardiness. We used the 15-item Norwegian Dispositional Resilience Scale (Hystad, Eid, Johnsen, Laberg, & Bartone, 2010) to measure hardness (e.g., Most of my life gets spent doing things that are meaningful). Items were presented to respondents in Likert-type format with a 4-point response scale that ranged from Not at All True (0) to Completely True (3). Scale scores were computed by reverse scoring negatively keyed items and summing across items, with higher scores indicating higher levels of hardiness. Cronbach alpha coefficient for the scale was .69. However, because Cronbach alpha is not as accurate a measure of reliability
for multidimensional constructs (Graham, 2006; Raykov, 1997, 2001), we evaluated reliability using Raykov’s (2001) Rho coefficient. Raykov’s Rho is based on the less restrictive congeneric measurement model, which, unlike the essentially tau-equivalent, has no assumptions of equal (item) factor loadings. Raykov’s Rho coefficient was .72.

**Social desirability.** We used the 10-item Norwegian version of the Marlowe-Crowne Social Desirability Scale (Rudmin, 1999) to control for social desirability of responding (e.g., I have never deliberately said something that hurt someone’s feelings). Items were presented in dichotomous, *True* (1)—*False* (0), response format. Scale scores were computed by summing across items, with higher scores indicating greater levels of social desirability. Cronbach alpha coefficient for the scale was .60. Although relatively low, the reliability coefficient for social desirability is comparable to the estimates reported in Rudmin (1999) and is also likely to increase if a Likert response format is used instead of the true-false option (Halpin, Halpin, & Arbet, 1994; Rudmin, 1999).

**RESULTS**

We evaluated our hypothesis by comparing hardiness scores of admitted (n = 569) and not-admitted (n = 542) officer applicants using an independent-samples *t*-test. Results showed that successful applicants’ hardiness scores were significantly higher than not-admitted applicants (M = 36.76, SD = 4.17 vs. M = 35.55, SD = 4.51, respectively; *t*(1091.44) = −4.64, *p* < .001). Cohen (1988) has suggested the following operational definition regarding the size of difference between two means: An effect size *d* of .20 is considered small, a *d* of .50 is considered medium, and a *d* of .80 is considered large. Based on Cohen’s recommendations, the difference in means between admitted and not-admitted officer applicants can be interpreted as small in magnitude (Cohen’s *d* = .28).

To further examine these results, we performed a sequential logistic regression analysis. In these analyses, we entered gender, age, and social desirability as control variables in the preceding step and hardiness scores in the last step as predictors of admission into officer training programs. Due to some missing data points, this analysis included 1,094 officer applicants. Results of logistical regression analysis are presented in Table 1. As can be seen in Table 1, gender and age entered in Block 1 did not make a significant contribution to the prediction of admission, χ² (2, *N* = 1094) = 0.88, *p* = .64; and social desirability entered

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1Cronbach’s *α* tends to underestimate the reliability of a scale unless the very restrictive condition of (essentially) tau-equivalence holds (see Lord & Novick, 1968 for an in-depth treatment of tau equivalence).
### TABLE 1
Results of Logistic Regression Analysis Predicting Admission Into Military Officer Training Programs

<table>
<thead>
<tr>
<th>Variables</th>
<th>B_{Step 1}</th>
<th>B_{Step 2}</th>
<th>B_{Step 3}</th>
<th>Wald Statistic</th>
<th>OR</th>
<th>95% CI</th>
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<tbody>
<tr>
<td>Step 1</td>
<td></td>
<td></td>
<td></td>
<td>0.17</td>
<td>0.15</td>
<td>0.13</td>
</tr>
<tr>
<td>Gender</td>
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<td>0.00</td>
<td>−0.02</td>
<td>−0.03</td>
<td>−0.01</td>
<td>0.13</td>
</tr>
<tr>
<td>Age</td>
<td>0.09</td>
<td>0.09</td>
<td>−0.02</td>
<td>0.08</td>
<td>−0.01</td>
<td>0.13</td>
</tr>
<tr>
<td>Social desirability</td>
<td>−0.03</td>
<td>−0.01</td>
<td>0.13</td>
<td>0.06</td>
<td>0.00</td>
<td>0.13</td>
</tr>
<tr>
<td>Hardiness</td>
<td>0.06</td>
<td>0.18</td>
<td>0.26</td>
<td>18.65***</td>
<td>1.065</td>
<td>[1.04, 1.10]</td>
</tr>
</tbody>
</table>

Note. N = 1094. B = unstandardized regression coefficient; OR = odds ratio; CI = confidence interval. Men = 0, women = 1. Final model \( \chi^2(4) = 20.927, p < .001 \).

*Estimates from the final step of the model (Step 3).

**p < .001.

in Block 2 did not make a significant contribution to the prediction of admission, \( \chi^2 (1, N = 1094) = 0.69, p = .41 \). However, hardness entered in Block 3 was significantly predictive of admission, \( \chi^2 (1, N = 1094) = 19.36, p < .001, B = .06, p < .001 \). The obtained odds ratio of 1.065 indicates that for a one-unit increase in hardness, the odds of admission into officer training programs increases by a factor of 1.065, or approximately 6.5%, holding all other variables constant. As an approximation to \( R^2 \) for our final model, we regressed the predicted outcome scores on the actual outcome scores. This regression resulted in an \( R^2 \) of .02.

### DISCUSSION

The purpose of this study was to evaluate psychological hardness as a potential predictor of admission into Norwegian Military Officer Schools. In support of our hypothesis, the results from the logistic regression showed that after controlling for gender, age, and social desirability responding, hardness made a small but statistically significant contribution to the prediction of admission into officer training programs. As such, this study extends previous research, which has demonstrated positive relationships between hardness and performance among Norwegian military personnel (Eid et al., 2008; Johnsen et al., 2009).

The results from this study are in agreement with the findings of Bartone and associates (2008), who examined hardness as a predictor of success in U.S. Army Special Forces candidates. These authors found that graduates of U.S. Army Special Forces candidate school were significantly higher in their hardness scores than nongraduates. The effects sizes in the Bartone et al. (2008) study for the
difference in means in hardiness ($d = .14$ and $d = .24$ for a 15-item and a 30-item Dispositional Resilience Scale, respectively) are comparable to the effect size found in the present study ($d = .28$).

One implication of our findings is that they provide support for the cross-cultural significance of hardiness. Although Maddi and Harvey (2006, p. 422) have stated that there is “no clear-cut conceptual basis for differentiating the relevance and role of hardiness across demographic variables and culture types,” it is still important to test this assumption and replicate results within different cultures. The majority of hardiness research has used U.S.-based participants, and caution must be exercised when applying theory and findings from one culture to another. The results from our study, however, suggest that psychological hardiness is a relevant construct in Norway as well.

The results from this study, coupled with findings demonstrating hardiness to be related to the well-being of both officer candidates (e.g., Skomorovsky & Sudom, 2011) and deployed military personnel (e.g., Bartone, 2000), point to hardiness not only as a possible selection criteria but also as an important element to incorporate into basic training. Although hardiness is usually considered an individual disposition that remains relatively stable over time, it has been suggested that individual levels can be trained (Maddi, 2007). In a recent review, Bartone and Hystad (2010) conclude that the available empirical evidence suggests that increasing levels of hardiness seem possible, but it is not likely to be easy or quick.

One approach to increasing hardiness is to structure the organizational environment in such a way that resilient or hardy responses in the workforce are encouraged. In group-oriented and hierarchical organizations such as the military, the leader will have a crucial role in this process. Leaders who themselves are high in hardiness can have dual roles, in that they lead by example and act as mentors while also implementing policies, setting priorities, and giving directives that will increase and maintain hardiness in their subordinates. Another promising avenue to hardiness training involves adjusting existing military training programs by incorporating knowledge from the hardiness framework and emphasizing more explicitly the qualities associated with hardiness.

In summary, results from the present study showed that after controlling for gender, age, and social desirability, hardiness predicted admission into Norwegian Military Officer Schools. The financial aspects of personnel training and attrition, not to mention the human element related to ineffective coping in stressful, military environments, have made the search for predictors of success and efficient selection procedures central. Personality tests have historically suffered in comparison to cognitive tests, but evidence is accumulating demonstrating that personality measures too can be useful in personnel selection (Rumsey & White, 2010). Although the effects in this study are modest, psychological hardiness may
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offer a valuable, inexpensive, and easy-to-use personality factor to help predict success in military assessment and selection programs.

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