Hardiness and undergraduate academic study: The moderating role of commitment

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Abstract

The purpose of this correlational study was to identify hardiness components that would explain variation in the academic performance of sport and exercise undergraduate students. Data were derived from 134 students from a university in the northeast of England admitted onto the second year of their degree in 2004 on the basis of successful progression from the first year of study. Students completed the hardiness PVS III-R, a measurement of commitment, control, challenge, and total hardiness, at the beginning of their second year of study, and provided consent for their academic progress to be tracked. Year 2 GPA, Year 3 GPA, final degree GPA, and final-year dissertation mark determined academic success. Commitment and total hardiness were significantly positively correlated with academic success criteria. In particular, the potential moderating role of commitment on academic performance has implications for educators and researchers.

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1. Introduction

Academic achievement has been typically associated with psychometric intelligence tests (Gottfredson, 2003; Kuncel, Hezlett, & Ones, 2001) and achievement motivation (Busato, Prins, Elshout, & Hamaker, 2000; Mellanby, Martin, & O’Doherty, 2000), where the latter can be conceptualised in terms of personality characteristics (Rindermann & Neubauer, 2001). Increasingly, personality variables have become implicated in isolation, as they appear to be powerful enough on their own to explain a moderate percentage of the variance in academic performance (Rindermann & Neubauer, 2001; Sanchez-Marin, Rejano-Infante, & Rodriguez-Troyano, 2001). In particular, of the Big Five personality factors (Costa & McCrae, 1992), researchers have consistently found a positive relationship between conscientiousness and university academic achievement (cf. Busato et al., 2000; Chamorro-Premuzic & Furnham, 2003; Duff, Boyle, Dunleavy, & Ferguson, 2004; Furnham, Chamorro-Premuzic, & McDougall, 2003).

Highly conscientious students are characterized as being intellectually curious and may be more achievement oriented, hard working, and persevering (Komarraju & Karau, 2005). Such a character description fits well with the ‘hardy personality’ (Kobasa, 1979). Interestingly, hardiness has been shown to be correlated positively to conscientiousness (Maddi, Khoshaba, Persico, et al., 2002; Ramanaiah & Sharpe, 1999), though conceptually distinct (Sansome, Wiebe, & Morgan, 1999). In addition, studies have shown the positive influence of hardiness on undergraduates coping with university first-year stress (Maddi, Wadhwa, & Haier, 1996), student adjustment to university life (Mathis & Lecce, 1999), and student retention (Maddi, Khoshaba, Jensen, et al., 2002).

Hardiness has been conceptualised as a combination of the three attitudes (3Cs) of commitment, control, and challenge (Kobasa, 1979). Commitment (vs. alienation) epitomizes those individuals who are committed to and feel deeply involved in the activities of their lives. Control (vs. powerlessness) reflects a desire to continue to have an influence on the outcomes going on around you, no matter how difficult this becomes. Challenge (vs. security) typifies an expectation that life is capricious, that changes will stimulate personal development, and that potentially stressful situations are appraised as exciting and stimulating rather than threatening (Maddi, 2006).

The behavioural manifestations of the three hardiness attitudes can be extended to the higher education environment (see Fig. 1). The moderating effect of commitment on academic performance may be demonstrated by students becoming deeply involved in their studies, seeing this as the best way to turn whatever they are experiencing into something that seems interesting, worthwhile, and important. Such an attitude is likely to facilitate industriousness and a willingness to expend extra time and effort to meet academic goals. Students high in control ought to be able to manage their studies; for example, demonstrating good time management, prioritising those activities deemed most contributory to academic success, and taking responsibility for their own learning and development. Attitudes reflecting challenge should moderate academic performance by affording students the opportunity to appraise potentially stressful situations as exciting and stimulating rather than threatening. This ought to increase the likelihood of students accepting the difficulties associated with fulfilling academic course requirements and engaging in the process of working toward a degree, thus facilitating the positive process of growth through learning (Maddi, 2006).
The 3Cs of hardiness are a cognitive/emotional amalgam constituting a learned, growth-oriented, personality style. That strong hardy attitudes in students are desirable is clear in that hardiness facilitates turning stresses to advantage, growing in such enhanced performance criteria as creativity, wisdom, and fulfilment, and maintaining or enhancing physical and mental health (Maddi, 2006). If hardy attitudes are strong, individuals will show an action pattern of coping with stressful circumstances (e.g., examinations, meeting course work deadlines, completing a final-year research project) by facing them, and striving to turn them from potential disasters into opportunities for self (Khoshaba & Maddi, 1999). The positive influence of hardiness on performance has been reported in such diverse samples as athletes (Golby & Sheard, 2004; Golby, Sheard, & Lavallee, 2003; Sheard & Golby, 2006), human resource consultants (Maddi et al., 2006), and military personnel (Bartone & Snook, 1999).

However, there is little evidence, to date, of the moderating role of hardiness on university academic performance. In keeping with many studies of personality and academic achievement (cf. Duff et al., 2004; Farsides & Woodfield, 2003; Paunonen & Ashton, 2001; Wagerman & Funder, 2007), the present study used Grade Point Average (GPA) as the criterion variable. It is interesting to note that Chamorro-Premuzic and Furnham (2003) employed students’ 6-month supervised final-year projects as a criterion variable. They found that final-year project marks were most significantly correlated with conscientiousness. Given the relationship between conscientiousness and hardiness (Maddi, Khoshaba, Persico, et al., 2002; Ramanaiah & Sharpe, 1999), similarly, in the present study, academic performance was assessed also through a 9-month supervised final-year project (henceforth ‘dissertation’).

Thus, the aim of this study was to explore the relationship between the 3Cs of hardiness, total hardiness, and undergraduate academic performance over two years using GPA and final-year dissertation performance (a single mark corresponding to a 9-month supervised final-year project) as criterion variables.
2. Method

2.1. Participants

Participants were full-time sport and exercise students, in one cohort, from a university in the northeast of England who successfully completed their 3-year undergraduate degrees in the summer of 2006. Predictors of academic achievement were examined in a sample of 134 target participants (78 male, 56 female; mean age = 20.87 years, SD = 2.66), who were those among an original sample of 169 undergraduates with sufficiently complete data for the present analyses, as described below. All students were fluent English speakers. Data for each participant were collected through two academic years (2004/2006).

2.2. Targets and informants

Adhering to advocated methods (cf. Wagerman & Funder, 2007), to deal with missing data, all participants in the larger sample who were lacking any one of the criterion variables (Year 2 GPA, Year 3 GPA, final degree GPA, dissertation mark) were dropped (reducing the N from 169 to 134). Failure to submit a dissertation (n = 14) and failure to progress successfully from Year 2 to Year 3 (n = 21) accounted for the 35 participants removed from the data analysis, leaving the final N = 134 for target participants. Means and standard deviations for both the criterion and predictor variables in this smaller sample were comparable to those of the larger group from which they were drawn.

2.3. Measures

Under the university’s regulations, first-year module marks do not contribute toward final degree GPA and subsequent classification. The second and third years of study have a 25% and 75% weighting, respectively, on the final degree GPA. Therefore, hardiness data were collected in the first week of the participants’ second academic year and academic performance was monitored from the beginning of Year 2 of participants’ degree program. Upon degree completion, academic performance and hardiness data were collected from the university archive by the first author.

2.3.1. Hardiness

Hardiness was assessed by the use of the Personal Views Survey III-R (PVS III-R; Maddi & Khoshaba, 2001). The PVS III-R is an 18-item scale that yields a total hardiness score (a composite of the scores of the three subscales), as well as scores for the 3 six-item subscales: commitment, control, and challenge. Item examples include, for commitment, “I often wake up eager to take up life wherever it left off,” for control, “Trying your best at what you do usually pays off in the end,” and for challenge, “Changes in routine provoke me to learn.” Scores were recorded on a 4-point Likert scale anchored by ‘not at all true’ and ‘very true’. Higher scores indicate desirable levels of hardiness. Total hardiness norms range from 19 to 49, with an average of 38–41 (Maddi & Khoshaba, 2001). Studies have shown the PVS III-R to have acceptable internal consistency (.70–.75 for
commitment, .61–.84 for control, .60–.71 for challenge, and .80–.88 for total hardiness; Maddi & Khoshaba, 2001; Maddi, Khoshaba, Persico, et al., 2002).

2.3.2. Academic performance

In all cases, assessments were recorded as percentages. Academic performance was calculated by averaging the percentages achieved in yearly assessments. Students were assessed using a valid and well-distributed variety of methods (i.e., essays, examinations, laboratory reports, seminar workshops, continuous assessment). Final assessment was then calculated by averaging Year 2 and Year 3, adhering to the 25%:75% ratio weighting mentioned previously. Year GPA and dissertation marks (final degree classification equivalent in parentheses) were achieved by formulae approximately designating an ‘A’ (first) to students obtaining assessment percentages of 70% or above, a ‘B’ (2.1) to students obtaining assessment percentages between 60% and 69%, ‘C’ (2.2) to students with percentages of 50%–59%, ‘D’ (3rd) to students with percentages of 40%–49%, ‘borderline fail’ (pass degree) to students with percentages between 35% and 39%, and ‘fail’ (fail degree) to students with percentages below 35%.

Dissertation performance was assessed by a single mark for a 9-month final-year research project, elaborated under the supervision of a member of academic staff, and double-marked by the supervisor and a second member of academic staff (and moderated by an external examiner). It is noteworthy that no academic staff or external examiners had any information about the participants’ hardiness scores.

2.4. Procedure

Permission from all appropriate university authorities to collect data and participants’ informed consent were obtained at the outset of the study. Individual participation was entirely voluntary. The nature of the data to be collected was explained to participants and they were advised that their progress throughout their time at the university would be monitored in terms of their grades. No students declined to participate in the study. No incentive for participation was offered. The PVS III-R was administered to students during a scheduled lecture in the first week of the second year of their degree study program. Instructions were given both verbally and in writing, and students’ confidentiality was guaranteed. No time limit was imposed for the completion of the inventory, but average completion time was approximately 5 min.

2.5. Data analyses

To ascertain the extent of the relationship between hardiness and academic performance, data were analyzed using Pearson product-moment correlation coefficients. Further, using the median, scores on the hardiness 3Cs were categorized as ‘high’ or ‘low’ in order to conduct meaningful multivariate analyses of variance (MANOVA). For the MANOVA, total hardiness, commitment, control, and challenge score subgroups (i.e., high or low) served as the independent variables, while academic performance (i.e., Year 2 GPA, Year 3 GPA, final degree GPA, and dissertation mark) served as the multivariate dependent variables. The partial eta-squared ($\eta^2$) statistic estimated the effect size associated with each statistical difference (Heiman, 2002). Alpha was set at .05. All statistical analyses were conducted using SPSS for Windows v.13.0 (SPSS Inc., Chicago, IL).
3. Results

3.1. Correlations

Correlations between academic performance and hardiness are presented in Table 1. Commitment was the most significant positive correlate of academic performance. This hardiness component was significantly positively related to Year 2 GPA, final degree GPA, and dissertation mark. The relationship between commitment and Year 3 GPA also approached statistical significance. There was also a significant positive correlation between total hardiness and dissertation mark. Neither control nor challenge was a significant correlate of academic performance in the present study. Counter-intuitively, challenge was negatively related to academic performance. Among the hardiness 3Cs, the commitment/control ($r = .49$, $p < .001$) relationship was strongest. Though producing only moderate correlation coefficients, the commitment/challenge ($r = .15$, $p = .084$) and control/challenge ($r = .16$, $p = .058$) relationships approached statistical significance. Each of the hardiness 3Cs was significantly positively correlated with total hardiness ($p < .001$).

3.2. Subgroup differences

Two MANOVAs were performed separately on the total hardiness scores and the three hardiness components, respectively. Using the median of each measure, participants were allocated to either ‘high’ or ‘low’ total hardiness, commitment, control, and challenge subgroups. Levene’s test ($p > .05$) revealed homogeneity of variance for the present sample on all measured dependent variables. A one-way MANOVA of academic performance by total hardiness subgroups indicated a significant multivariate effect, Wilks’ $\lambda = 0.93$, $F(4, 129) = 2.56$, $p = .041$, partial $\eta^2 = .074$. Specifically, students in the ‘high’ total hardiness subgroup (i.e., score $> 38$) achieved a higher mean dissertation mark, $F(1, 132) = 7.26$, $p = .008$, partial $\eta^2 = .052$. A three-way MANOVA of academic performance by subgroups of the three hardiness components revealed a significant multivariate effect for the commitment subgroup, Wilks’ $\lambda = 0.86$, $F(4, 123) = 4.95$, $p = .001$, partial $\eta^2 = .139$.

<table>
<thead>
<tr>
<th></th>
<th>Control</th>
<th>Challenge</th>
<th>Total hardiness</th>
<th>Year 2 GPA</th>
<th>Year 3 GPA</th>
<th>Final degree GPA</th>
<th>Dissertation mark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commitment</td>
<td>.49***</td>
<td>.15</td>
<td>.79***</td>
<td>.25**</td>
<td>.16</td>
<td>.19*</td>
<td>.30***</td>
</tr>
<tr>
<td>Control</td>
<td>.16</td>
<td>.80***</td>
<td>.11</td>
<td>.11</td>
<td>.11</td>
<td>.11</td>
<td>.13</td>
</tr>
<tr>
<td>Challenge</td>
<td>.56***</td>
<td>-.10</td>
<td>-.11</td>
<td>-.14</td>
<td>-.03</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total hardiness</td>
<td>.13</td>
<td>.09</td>
<td>.09</td>
<td>.09</td>
<td>.19*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year 2 GPA</td>
<td></td>
<td></td>
<td>.75***</td>
<td>.84***</td>
<td>.63***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year 3 GPA</td>
<td></td>
<td></td>
<td>.96***</td>
<td>.78***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Final degree GPA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.79***</td>
</tr>
</tbody>
</table>

$N = 134$.

* $p < .05$.

** $p < .01$.

*** $p < .001$. 

Table 1

Intercorrelations between academic performance and hardiness
Students in the ‘high’ commitment subgroup (i.e., score > 15) achieved a higher mean Year 2 GPA, \( F(1, 126) = 7.50, p = .007, \) partial \( \eta^2 = .056, \) and a higher mean dissertation mark, \( F(1, 126) = 9.33, p = .003, \) partial \( \eta^2 = .069. \) No significant multivariate effects were observed for the control, Wilks’ \( \lambda = 0.95, F(4, 123) = 1.64, p = .168, \) partial \( \eta^2 = .051, \) or challenge, Wilks’ \( \lambda = 0.93, F(4, 123) = 2.33, p = .06, \) partial \( \eta^2 = .07, \) subgroups. There were no significant multivariate interaction effects. Means and standard deviations of all variables are presented in Table 2.

### Table 2

<table>
<thead>
<tr>
<th>Hardiness measures</th>
<th>Academic performance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Year 2 GPA</td>
</tr>
<tr>
<td></td>
<td>( M )</td>
</tr>
<tr>
<td>Commitment (Mdn = 15)</td>
<td></td>
</tr>
<tr>
<td>( \leq 15 ) (( n = 69 ))</td>
<td>52.95</td>
</tr>
<tr>
<td>&gt;15 (( n = 65 ))</td>
<td>57.39</td>
</tr>
<tr>
<td>Control (Mdn = 10)</td>
<td></td>
</tr>
<tr>
<td>( \leq 10 ) (( n = 87 ))</td>
<td>54.55</td>
</tr>
<tr>
<td>&gt;10 (( n = 47 ))</td>
<td>56.12</td>
</tr>
<tr>
<td>Challenge (Mdn = 12)</td>
<td></td>
</tr>
<tr>
<td>( \leq 12 ) (( n = 70 ))</td>
<td>55.36</td>
</tr>
<tr>
<td>&gt;12 (( n = 64 ))</td>
<td>54.83</td>
</tr>
<tr>
<td>Total hardiness (Mdn = 38)</td>
<td></td>
</tr>
<tr>
<td>( \leq 38 ) (( n = 83 ))</td>
<td>54.48</td>
</tr>
<tr>
<td>&gt;38 (( n = 51 ))</td>
<td>56.12</td>
</tr>
</tbody>
</table>

4. Discussion

The aim of this study was to examine the relationship between the hardiness 3Cs (commitment, control, and challenge), total hardiness and undergraduate academic success. Of the individual hardiness attitudes, only commitment was significantly positively related to measures of academic performance. Total hardiness (a composite of the 3Cs) was significantly positively correlated with dissertation mark. Control and challenge bore no significant linear relationship with academic success.

In support of the conceptualization of commitment, the findings of the present study suggest a clear relationship between academic success and viewing academic work as important and worthwhile enough to warrant students’ full attention, imagination, and effort (Maddi & Khoshaba, 2005). It is suggested that commitment’s moderating role in successful academic performance is manifested by students’ deep involvement in their studies that also facilitates a preparedness to exert effort in the pursuit of scholarly success (see Fig. 1). Students adopting such behavior would also appear to avoid unproductive alienating social behaviors, viewing withdrawal from stressful situations as weak (Maddi, 2006).
The counter-intuitive finding that challenge was negatively related to academic success is of particular interest. Hardiness is conceptualized as a personality style that develops, rather than is innate (Maddi & Khoshaba, 2005). If one is strong in challenge, one sees difficulties as a normal part of living, and an opportunity to learn, develop, and grow in wisdom (Maddi, 2006). In the present study, those students who achieved a higher GPA or dissertation mark appeared to do so in spite, and not because, of behavioral manifestations of challenge. The increasingly competitive and pressurized environment of undergraduate academic study may not have afforded more reflective students the opportunity to benefit from the process of learning what was happening (Maddi et al., 2006). Further, it is possible that students were not learning how to use feedback from their efforts to deepen their challenge attitude (Khoshaba & Maddi, 2001). Further studies should investigate whether the results in this study emerge as a consistent finding or as an artifact of the present sample.

Using GPA as a measure of academic performance is widely recognized. The use of projects and dissertations in university curricula has been seen as increasingly important. It is generally accepted that final-year dissertations are an effective means of research training and of encouraging a discovery approach to learning, through the generation and analysis of primary data (Marshall, 2001). In addition, dissertations are also seen as an effective means of, in particular, (a) addressing concern to promote transferable skills, (b) empowering the student, and (c) providing student motivation (Marshall, 2001). Given the clear emphasis dissertations place on the student taking responsibility for his/her learning, this was deemed an appropriate criterion variable with which to examine the moderating influence of hardiness.

Despite this, it is important to recognize some potential limitations of the present study. The hardiness attitude most significantly correlated with academic success, commitment, explained only 6%, 3%, 4%, and 9% of the variance in Year 2 GPA, Year 3 GPA, final degree GPA, and dissertation mark, respectively. Therefore, relative differences in levels of commitment among undergraduates in this sample explained less variance in academic performance than conscientiousness in similarly designed studies (cf. Chamorro-Premuzic & Furnham, 2003; Furnham et al., 2003). Data collected from a larger sample of students, drawn from a broad range of disciplines, and from different academic institutions, may shed further light on the relationship between commitment and undergraduate academic achievement. Moreover, using commitment as a predictor variable in conjunction with conscientiousness would offer evidence of the hardiness attitude’s incremental predictive validity with a well-established predictor of academic performance.

Given that education has been shown to have little effect on life satisfaction in itself, but appears to be an important factor in personal development (Marks & Shah, 2005), the findings of the present study are particularly relevant. Students were rewarded for their high commitment attitude with correspondingly good academic grades. Similarly, the obverse may be true. Academic success should reinforce students’ already strong commitment attitudes, thus making them more apt to commit and to dedicate themselves in future (Maddi & Khoshaba, 2005).

In summary, the findings of the present study suggest that students high in total hardiness and commitment, in particular, are likely to do better in terms of their academic performance. Further studies may wish to extend this research by, for example, investigating the relationships between hardiness, intelligence, cognitive competence, and learning strategies, and the subsequent effect on academic performance. The increasing number of part-time and mature-age university students
would also make a comparison of hardiness’ contribution to academic success relative to student age a particularly relevant enquiry. In particular, longitudinal studies (cf. Heaven, Ciarrochi, & Vialle, 2007) may afford opportunities to test causal assumptions. Universities may then be better equipped to tailor higher education and support services in order to maximize students’ chances of academic success.

References


