

Learned Resourcefulness Moderates the Relationship Between Academic Stress and Academic Performance

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ABSTRACT *People high in learned resourcefulness are purported to be better than others at controlling their negative emotions and managing stressful tasks. We hypothesised that highly resourceful students would be more effective than others at protecting themselves from the adverse effects of academic stress, and not allowing that stress to impact their grades. A sample of 141 first-year undergraduate students completed measures of academic stress and learned resourcefulness. Their first-year grade point averages were obtained from university records. Analyses revealed that academic stress was negatively associated with academic performance. As expected, this negative association was moderated by learned resourcefulness. High academic stress adversely impacted the grades of low resourceful students but had no effect on high resourceful students. We discuss the implications of these findings for improving academic performance.*

Introduction

Academic stress pervades the life of students, and tends to impact adversely their mental and physical health, and their ability to perform schoolwork effectively (Clark & Rieker, 1986; Felsten & Wilcox, 1992). What are the skills that students need to protect themselves from this stress? One promising construct is that of learned resourcefulness, which is defined as a set of skills for regulating internal events such as emotions that might otherwise interfere with the smooth execution of a target behaviour. Previous research suggests that people high in learned resourcefulness deal more effectively with experimentally induced stress, preventing that stress from interfering with their cognitive performance, such as when solving anagram problems (Rosenbaum, 1980; Rosenbaum & Jaffe, 1983). We examined whether these findings generalised to a more naturalistic, educational setting. In particular, we sought to examine whether students

high in learned resourcefulness would deal more effectively with academic stress, preventing that stress from interfering with their ability to obtain high grades.

Stress and Academic Performance

Academic problems have been reported to be the most common source of stress for students (Aldwin & Greenberger, 1987). For example, Schafer (1996) asked college students about their most stressful daily hassles. He observed that the most irritating daily hassles were usually school-related stressors such as constant pressure of studying, too little time, writing term papers, taking tests, future plans, and boring instructors.

Stress associated with academic activities has been linked to various negative outcomes, such as poor health (Greenberg, 1981; Lesko & Summerfield, 1989), depression (Aldwin & Greenberger, 1987), and poor academic performance (Clark & Rieker, 1986; Linn & Zeppa, 1984). For example, Lesko and Summerfield (1989) found a significant positive correlation between the incidence of illness and the number of exams and assignments. Similarly, Aldwin and Greenberger (1987) found that perceived academic stress was related to anxiety and depression in college students.

A number of studies have found a relationship between stress and poor academic performance (Clark & Rieker, 1986; Linn & Zeppa, 1984, Struthers, Perry & Menec, 2000). Felsten and Wilcox (1992) found a significant negative correlation between the stress levels of college students and their academic performance. In a similar study, Blumberg and Flaherty (1985) found an inverse relationship between self-reported stress level and academic performance. Struthers et al. (2000) also reported that a high level of academic stress was associated with lower course grades. Students experience a high level of academic stress due to exams, assignments, time pressure, grade pressure, and uncertainty. In summary, this stress has a detrimental effect on their academic performance.

Learned Resourcefulness, Stress, and Performance

Learned resourcefulness has been defined as "an acquired repertoire of behavioural and cognitive skills with which the person is able to regulate internal events such as emotions and cognitions that might otherwise interfere with the smooth execution of a target behaviour" (Rosenbaum, 1990, p. xiv). Rosenbaum (1980) developed a self-report measure assessing individuals' general repertoire of self-control behaviour and their tendencies to use these behaviours when faced with everyday problems. Rosenbaum (1990) suggests that high resourceful individuals, using their self-control skills, can minimise the negative effect of stress on their performance. For example, two students may be equally anxious when they have an exam, but they may differ in their learned resourcefulness. The high resourceful student may use various self-control skills to minimise the effects of his or her anxiety on performance, while the less resourceful student's performance may negatively be affected by his or her anxiety.

Rosenbaum and Jaffe (1983) tested the relationship between an individual's learned resourcefulness and performance level in the face of stressful events (that is, repeated failures). They found that high resourceful subjects showed significantly better performance in an anagram task than low resourceful subjects, following the inescapable noise condition. These results led Rosenbaum and Jaffe to conclude that the negative effects of uncontrollable failure are moderated by individuals' repertoire of self-control behaviour.

In another experiment, Rosenbaum and Ben-Ari (1985) tested the role of learned resourcefulness in the occurrence and generalisation of learned helplessness. Their results revealed that after being exposed to repeated stressful events (failures on the training task), low resourceful subjects exhibited performance deficits on the subsequent task, whereas high resourceful subjects exhibited reassertion. The results of these two studies (Rosenbaum & Ben-Ari, 1985; Rosenbaum & Jaffe, 1983) suggest that individual differences in learned resourcefulness play an important role in an individual's response to stress.

A number of studies have examined the effect of learned resourcefulness on performance in laboratory tasks (Rosenbaum & Ben-Ari, 1985; Rosenbaum & Jaffe, 1983; Rosenbaum & Rolnic, 1983), but do these effects generalise to a more ecologically valid setting, namely, one involving actual school performance? In one set of ecologically realistic studies, Kennet (1994, 1996) found that low resourceful students were more likely than high resourceful students to drop out of an academic self-management course. Surprisingly, there is little other research that examines the link between resourcefulness, stress, and academic performance. This was the objective of the present research. It was expected that academic stress would have a negative effect on academic performance, as has been found in past research (Clark & Ricker, 1986; Felsten & Wilcox, 1992; Struthers et al., 2000). Importantly, we expected that this negative effect would be weaker amongst students high in learned resourcefulness.

Method

Participants

Self-Control Schedules and Undergraduate Stress Questionnaires were distributed to 365 first-year undergraduate students from the University of Wollongong, New South Wales, Australia. Of these, 168 were returned (49%) but 27 were not used as participants failed to complete the questionnaires correctly (they did not answer the questions, or failed to rate the stressfulness of events). Our final sample consisted of 141 participants (mean age = 19.54, SD = 3.56), 45 male and 96 female. Psychology first-year students gained bonus points for their participation in the study.

Materials

Learned resourcefulness was assessed by Rosenbaum's (1980) Self-Control Schedule (SCS). This 36-item self-report questionnaire assesses individuals' general repertoire of self-control behaviours and their tendencies to use these behaviours when faced with everyday problems. The questionnaire is scored on a six-point Likert scale ranging from "very characteristic of me" (+ 3) to "very uncharacteristic of me" (- 3), and assesses the following:

- the use of self-statements to control emotional responses such as, "When I am feeling depressed, I try to think about pleasant events";
- the application of problem-solving strategies such as, "When I am faced with a difficult problem, I try to approach it in a systematic way";
- the ability to delay immediate gratification such as, "I tend to postpone unpleasant tasks even if I could perform them immediately"; and
- perceived self-efficacy such as "I need outside help to get rid of some of my bad habits".

TABLE I. Means and standard deviations of academic performance, learned resourcefulness, and academic stress

Variable	Mean	SD
GPA	64.61	11.19
Learned resourcefulness	20.90	24.52
Academic stress 44.94	14.47	

Note: $n = 141$

Total SCS scores for normal populations can range from -108 to $+108$. The mean score is usually 25 with a standard deviation of 20 (Kennet, 1994; Rosenbaum, 1990). The mean score for the present research sample was 20.90 with a standard deviation of 24.52 . Rosenbaum (1980) reported test-retest reliability over four weeks of 0.86 and alpha coefficients of 0.78 – 0.86 . The internal reliability of SCS for the present sample was 0.83 (Cronbach's Alpha), which suggests that the items were reasonably homogeneous.

The level of academic stress experienced by participants in this investigation was measured by the 20 academic stress items taken from Crandall, Preisler and Aussprung's (1992) Undergraduate Stress Questionnaire (USQ). Example items include "working while in school," and "did badly on a test." Participants indicate which of these events they experienced during the academic year, and if experienced, how stressful each event was. Responses ranged from 1 ("did not happen") to 5 ("happened and was extremely stressful"). The sum of the ratings was used as the stress measure. Academic stress scores could range from 0 to 100 . The internal reliability of the stress measure was 0.86 (Cronbach's Alpha).

Procedure

Participants completed the two questionnaires anonymously. Students' first-year grade point averages (GPA) at the end of the academic year were obtained from the university's student records office with the students' explicit permission. All the participants signed an informed consent form prior to completing the questionnaires, indicating their willingness to participate in the study. They were also informed that they could withdraw from the research project at any time without penalty.

Results

Means and standard deviations of the three central measures are presented in Table I. The mean GPA was 65% . We also examined the relationships between each of our independent variables and found no significant relationships between stress, resourcefulness, and gender (all $P > 0.1$). There was also no direct correlation between resourcefulness and GPA ($r = 0.1$, $P > 0.05$).

We conducted multiple linear regression analyses in order to test our hypothesis that learned resourcefulness moderates the relationship between stress and academic success. Learned resourcefulness, academic stress, and gender acted as independent variables in predicting GPA. All two-way interactions were also included in the model. The three-way interaction did not approach significance [$F(1,133) = 1.99$, $P > 0.1$],

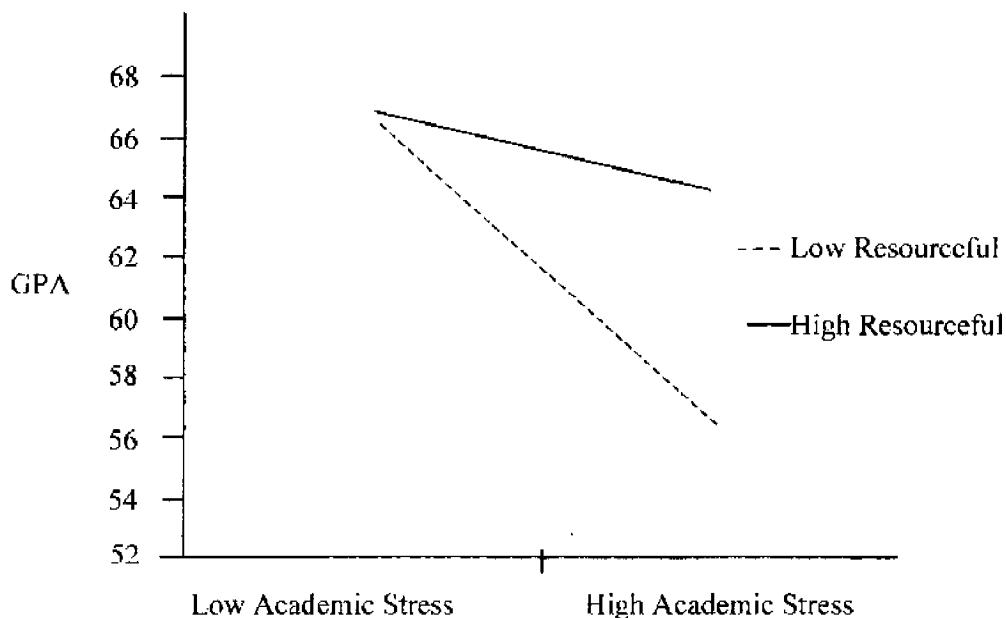


FIG. 1. Academic performance (GPA) as a function of academic stress and learned resourcefulness.

and consequently was removed from the model. In order to reduce the problem of collinearity (Aiken & West, 1991), resourcefulness and stress scores were transformed to z scores, and gender was coded as -1 (male) and 1 (female).

The results of F tests indicated that the main effect of gender was significant [$F(1,134) = 22.76, B = -8.48, P < 0.01$], suggesting that female students had higher GPAs than males. The main effect of academic stress on academic performance was also significant [$F(1,134) = 12.10, B = -3.15, P < 0.01$], indicating that higher academic stress was associated with lower grades. As predicted, this main effect was qualified by a significant interaction with resourcefulness [$F(1,134) = 4.31, P < 0.05$]. To explore this interaction, we followed the suggestion of Aiken and West (1991) and substituted z score values of -1 (low resourcefulness) and $+1$ (high resourcefulness) into the learned resourcefulness variable in the regression model, generating the simple effects presented in Fig. 1. This figure suggests that stress had a greater impact on the GPAs of low resourceful students than high resourceful students.

We performed follow-up tests to evaluate whether the simple slopes presented in Fig. 1 differed from 0. Univariate F tests indicated that the effect of academic stress on GPA amongst low resourceful students was significant [$F(1, 134) = 17, B = -4.95, P < 0.01$], whereas this effect was not significant amongst high resourceful students [$F(1,134) = 1.06, B = -1.35, P > 0.05$]. Thus, stress had an adverse impact on students low in resourcefulness but did not seem to impact those high in resourcefulness.

Discussion

The purpose of this study was to examine the effect of academic stress and learned resourcefulness on academic performance. It was hypothesised that academic stress would be associated with a low level of academic performance. Results provided support for this hypothesis by revealing a significant negative effect of academic stress

on academic performance. This result is consistent with previous research findings (Felsten & Wilcox, 1992; Struthers et al., 2000) indicating an inverse relationship between stress and academic performance.

Importantly, our research suggests that the negative impact of stress was moderated by learned resourcefulness. Specifically, academic stress had a significant negative effect on the academic performance of low resourceful students, but had no effect on high resourceful students. This result is consistent with previous laboratory studies where it was found that learned resourcefulness was related to performance in the face of stressful situations. For example, after being exposed to an inescapable noise condition or repeated failures, high resourceful subjects exhibited more successful performance in an anagram task than low resourceful subjects (Rosenbaum & Ben-Ari, 1985; Rosenbaum & Jaffe, 1983).

One possible explanation is that the stress experienced by resourceful students was in fact less severe than the stress experienced by others. However, we found no evidence that resourcefulness and stress severity were related. Thus, it appears that resourceful students experience as much academic stress as others, but are better able to deal effectively with that stress.

One potential limitation of the present research is that the stress measure and the learned resourcefulness measure were administered early in the academic year rather than prior to start of the academic year. (Academic stress had to be measured during the year in order for there to be the possibility of academic stress.) Thus, it is possible that students' academic performance might have influenced their learned resourcefulness scores, rather than vice versa. However, the learned resourcefulness measure was administered prior to a number of major class assessments, including the final exam (worth 50%) and a number of quizzes. Thus, these academic assessments and final GPA could not have impacted the learned resourcefulness measure. Also, research indicates that learned resourcefulness is stable across time (Rosenbaum, 1980), which suggests that experiences early in the semester would have had little impact on scores. Future research could evaluate these arguments by measuring learned resourcefulness after students receive positive or negative academic feedback.

Future research will also be needed to determine what variables might mediate the relationship between resourcefulness and academic performance. For example, it is possible that people high in learned resourcefulness have more general knowledge or study skills, and that this knowledge or skill may be responsible for the observed link between resourcefulness, stress, and grades. This sort of explanation leads one to expect that those high in knowledge or study skill would generally obtain better grades than those low in knowledge or skill. In contrast, the resourcefulness explanation predicts that those high in resourcefulness will obtain better grades only in conditions of high stress. Our pattern of findings supports the resourcefulness perspective. Under conditions of low stress, those low in resourcefulness obtained the same grades as those high in resourcefulness (see Fig. 1). Thus, it appears that those low and high in resourcefulness have sufficiently similar study skills and knowledge to achieve equivalent grades, at least under conditions of low stress. While this pattern of findings is consistent with the resourcefulness explanation, future research is needed to explicitly evaluate alternative explanations.

The present research suggests that it might be worthwhile to train people in learned resourcefulness, and evaluate the impact of such training on students' ability to deal effectively with stress (Elias et al., 1997). Meichenbaum's Stress Inoculation Program may be a particularly useful tool in this regard, as it has been shown to increase the

sense of learned resourcefulness, or the belief that one can effectively deal with manageable levels of stress (Meichenbaum, 1996; Rosenbaum, 1980). This program involves three phases. The conceptual phase involves establishing a collaborative relationship between trainer and client (or student in this case), and teaching them about the stress response and the role of appraisal processes in stress. The skills acquisition and rehearsal phase involves teaching coping skills, which are practised in the training setting and then in everyday life. The final application and follow-through phase provides students with the opportunity to apply a variety of coping skills across increasing levels of stressors. (See Meichenbaum, 1996, for more details and a review of the empirical findings related to this approach.)

The present research suggests that the learned resourcefulness measure may be useful in identifying students who may react poorly to academic stress. Special efforts could then be made to teach these students how to deal effectively with academic stress before such stress adversely impacts their grades. In summary, the learned resourcefulness construct has some potentially exciting applications within the educational context, and further research is certainly warranted.

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