Not just surviving, but flourishing – insights into student coping, anxiety and motivation

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Research Article

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Abstract

The aims explored the associations between distress and eustress ratings and coping influences (support, hardiness, personality and cognitive and emotional strategies), on anxiety and learning motivation. Undergraduate students in a UK university, (N = 184), were surveyed on stress demands and coping influences against anxiety and learning motivation. Hardiness-commitment and extraversion were associated with lower anxiety; neuroticism and defensive pessimism with higher scores and neuroticism mediated between stress demands and anxiety. Optimism did not help. Extraversion did and was associated with better cognitive and emotional coping and it mediated between hassle ratings given to support and anxiety. Defensive pessimism was used to good effect by those anxious-prone – there was no difference in learning motivation between those high in defensive pessimism and those high in extraversion. Eustress experiences of the course were associated with higher motivation, as was hardiness-commitment. Course hassle ratings lowered motivation. This might indicate course shortcomings and/or the stress associated with learning.

The results suggested extraversion, defensive pessimism, support and hardiness offer effective coping, along with key cognitive and emotional strategies. All are adaptable qualities, even extraversion can be feigned. Students should look to emulate the strategies and ingredients of good copers and, educators, with little imagination in course design, could help cascade good student-coping.

Introduction

Being a student at university offers the opportunity to grow, explore and to achieve. However, studies abound that show it is a period often associated with poor motivation and heightened anxiety (Gibbons, 2022a, 2022b; Neves & Hewitt, 2020). This study explored the experience of students in a UK university with a focus on the perception of stress and the key influences on coping and how this affects anxiety and motivation.

One of the most cited models of stress, the Transactional model, (Lazarus & Folkman, 1987), incorporates the perception and assessment of stress demands (the primary appraisal) along with the factors affecting coping (the secondary appraisal) and their influence on behaviour and health. Primary appraisals can lead to the judgment that the stressor is irrelevant, a challenge or a threat. As illustrated in Fig. 1, stress demands associated with optimal performance i.e., challenges one can achieve in, are sources of eustress (B). Those that are perceived as associated with apathy or boredom (A) or, more often, as exceeding one's capacity to cope (C), are sources of distress (Gibbons, 2008).

Research into stress usually operationalises it in terms of degrees of distress. This study adopted a positive psychology framework, with university demands measured using the UK National Student Survey (NSS), with an adapted response scale, allowing stress demands to be rated as hassles (that hold the potential to have an adverse effect on well-being) *and* as uplifts (that hold the potential to enhance well-being). This is consistent with the 'threat' and 'challenge' appraisals in the Transactional model.

Sources of student stress

Sources of student stress include academic demands, for example, coursework and exams; fear of failure, lack of timely feedback; the quality of teaching and work-life balance (Ansari, Oskrochi & Haghgoo, 2014, Gibbons, 2022a). Gibbons (2022b) found that teaching and course demands, along with a range of support – from peers, tutors, the wider university and one's partner, when rated as a hassle, were higher in those 'at risk' of a stress-related illness. Support rated as a hassle was also associated with lower motivation and higher anxiety (Gibbons, 2022b, 2023). Personal sources of stress include financial concerns, managing free time, working part-time while studying, and future concerns (McCloud & Bann, 2019; Gibbons, 2015). The changes students experience as they transition to university are frequently a source of acute stress. For most, they are learning to live independently, meet new people, adjust to new accommodation arrangements; manage their own finances and all along with the challenges posed by a course that may leave them feeling overwhelmed (Denovan & Macaskill, 2017; Denovan et al., 2019).

Stress effects

Well-being is defined as: '…a state of complete physical, mental and social well-being and not merely the absence of disease and infirmity' (World Health Organization, 2006, p.100). While critics question the assumption of 'completeness' as integral to wellbeing, the definition highlights the critical role of psychology in wellbeing. The experience of stress can affect student well-being: including depression, anxiety and happiness (Zhang et al., 2015, Gibbons & Murray-Gibbons, 2023); and, depending on how stress is construed, it can positively or negatively influence learning motivation (Gibbons, 2022a, 2022b).

One of the key outcomes or stress effects, measured in the NSS, is learning motivation and Descals-Tomás et al., (2021) argue that key to student motivation is how students experience support from within (e.g. tutors and peers) and outside (e.g. family and friends) the university. While the former tends to be more important, students with the highest motivation benefit from both. Critical support from educators comes through oral and written feedback, by praising success and by encouraging students' self-competence. Offering validation and emotional support was the most valued from family (Descals-Tomás et al., 2021). On the NSS, students rate a range of common experiences, such as teaching and learning, assessment and feedback, learning resources and the support infrastructure. Final year students are invited to complete the survey and the results are key in university league tables.

While understanding the influences on learning motivation is important, so too is understanding the influences on anxiety because of its association with performance *and* mental health. The *x* axis in Fig. 1, for example, is often operationalised through measures on anxiety, with increases in anxiety beyond the optimum, associated with a decline in performance, such as a narrowing in attention and a reduction in the efficiency of working memory (Eysenck, Derakshan, Santos & Calvo, 2007).

Gibbons (2022a) found lack of motivation and the hassle ratings given to support were key predictors of student anxiety. Conversely, uplifting ratings of support have been predictive of positive learning

motivation, student mental health and lower anxiety (Gibbons, 2010).

Coping with stress

According to Neves and Hewitt's (2020) UK survey, key predictors of course satisfaction in 2019 (n = 14072) and 2020 (n = 10227) were: the level of challenge in course demands; the student effort invested; the opportunity to interact with others, and how well the course was organised. Key influences on coping include personality and past experiences and these are drawn on to perceive and manage stress demands. Of the Big Five traits, the significance given to student effort in Neves and Hewitt's (2020) findings, reflects the importance of conscientiousness in relation to student performance and course satisfaction (Gibbons, 2022a; Ivcevic & Brackett, 2014). The opportunity to interact with other students reflects the importance associated with support (Gibbons, 2009; Taylor, 2011; Neves & Hewitt, 2020).

Context control, or the skills acquired to manage particular situations, has been found to be an important coping resource in several studies (Maddi, 2002), including in a H.E. context (Gibbons, 2015, 2022a, 2022b). Control and effort or commitment, is also built into Maddi's (2002) definition of hardiness. This refers to a set of attitudes that buffer the individual from adverse effects of stress and which help one adapt to change. It contains three components – commitment, control and challenge (the 3Cs):

In a learning context, those high in commitment become more engaged in any activity they think might enhance their learning and understanding. They invest effort and are proactive and eager to expand their understanding. This supports Neves and Hewitt's (2020) findings. Students high in commitment are proactive in learning and harnessing the skills or techniques or knowledge needed to learn. Those high in control make it a priority to identify the skills they need to master a learning situation and they do not avoid but faceup to the inevitable challenges in learning. Those high in challenge acknowledge that change and, with it, difficulty and, often, some feeling of insecurity, are necessary to improve. They reframe the change the challenge poses, not as a 'threat' but as a necessary step to learning (Maddi, Harvey, Khoshaba, Fazel & Resurreccion, 2009).

Academic hardiness is an adapted version of the original scale (Creed, Conlon & Dhaliwal, 2013). It measures how students react to academic demands and challenges. Maddi et al., (2009) offer evidence that those high in the 3Cs are more motivated in their learning and are higher in courage. This manifests, for example, in better stress management, social skills, diplomacy and conflict resolution and Maddi et al., (2009) see this as the basis for resilience and its efficacy is supported by other research into academic hardiness in university students (Creed et al., 2013; Daneshamooz and Alamolhodaei, 2012; Spiridon & Evangelia, 2015). The value of hardiness and other coping influences – like control, support and reframing stressors, is that they can be learnt and improved on rather than fixed or dispositional.

In terms of personality, the Big Five traits (McCrea & Costa, 2004) have been associated with coping and wellbeing: extraversion is associated with elevated mood and lower anxiety (Kuijpers et al., 2021); neuroticism or levels of emotional stability and openness are also predictive with most findings reporting positive correlations with anxiety (Vollrath & Torgersen, 2000, Gibbons, 2022). A meta-analysis review

exploring the relationship between extraversion and wellbeing and positive affect, reported a substantial effect size of *r* = .44 (Steel, Schmidt & Shultz, 2008). Interestingly, Hudson and Fraley (2017) found that within-person correlations between extraversion and wellbeing i.e., repeated testing over time, found those who acted more extraverted reported improved wellbeing. As well as illustrating that extraverted behaviour is common in those who cope well, it suggests that personality is adaptable.

Several studies have attempted to get participants to act or fake being extraverted or introverted. McNiel, Lowman and Fleeson (2010) replicated earlier findings by Fleeson, Malanos and Achille, (2002) and McNiel and Fleeson (2006), with participants asked to act extraverted or introverted in a ten-minute conversation. All those acting extraverted reported higher positive affect and, interestingly, this was irrespective of their baseline scores on trait extraversion. Jacques-Hamilton, Sun and Smillie, (2019) replicated the positive affect findings but with participants asked to act in a more extraverted way across a week, although they found the variance in positive affect was smaller when trait extraversion was controlled for.

Margolis and Lyubomirsky (2020) randomly assigned participants to fake being more extraverted over one week and more introverted over the next or vice versa They picked extraverted and introverted behaviours to fake that were similar in social desire-ability i.e., to fake being more talkative, assertive and spontaneous (extraversion) or deliberate, quiet and reserved (introversion) and they were given realistic scenarios in which they could do this, for example: 'When my friends are discussing something important to me, I will [will not] express my opinion'. They operationalized wellbeing as positive and negative affect, flow, competence, autonomy and connectedness. Significant main effects were found with positive affect, flow and connectedness for those faking extraversion and, like Jacques-Hamilton et al., (2019), this was most pronounced for those high in trait extraversion, i.e., where the behaviours they were asked to do matched their personality, but there was a boost to wellbeing for all.

There are several factors that explain why extraverts cope better. They may physiologically have a higher threshold for change and for stress stimuli in general compared to introverts (Eysenck & Eysenck, 2013; Gray, 1970). They are more people oriented and this means they tend to benefit more from support as a coping resource and because they cope better, they tend to interpret new stress demands, such as, for students, a disappointing teaching experience or disappointing assignment result or a poor interactions with peers, as less threatening compared to those coping less well; and extraverted traits – being outgoing, sociable, people-orientated etc., tend to be seen, in the West at least, as more socially desirable. This leads to more approval and boosts self-esteem.

Optimism is another quality associated with motivation, performance and well-being (Cabras & Mondo, 2018; Seligman, 2008; Sharot, 2011). However, some of the research evidence for optimism may mistake the effect for the cause – if one is successful, optimistic thinking will follow (the effect). The cause of that success may relate to any number of ingredients, such as the earlier evidence on control, support, confidence and extraversion, all qualities which optimists tend to score higher in (Gibbons, 2023).

There are negatives to optimism too – if one overestimates the likelihood of positive outcomes, disappointment will be experienced more and when positive outcomes occur, because they were expected, they will be enjoyed less (Bell, 1985). Pessimists do not experience this downside. For them, good outcomes are more enjoyable because they are unexpected and bad outcomes less disappointing because they were anticipated. There is a risk that low expectations may reinforce under-achievement, but Norem and Cantor (1986) offer evidence of circumstances where pessimism helps. They argue, for those anxious-prone and who have tended to do well, a more effective strategy, is defensive pessimism. This involves setting unrealistically low expectations in situations that cause you anxiety. Setting a high expectation of success could add to already heightened anxiety and inhibit performance, tipping you past the peak (B) to (C) in Fig. 1. Gibbons (2022a) found, for example, that students high (in the upper quartile) on defensive pessimism and in anxiety and who had tended to achieve, were just as high in learning motivation compared to those high (in the upper quartile) on optimism and in a later replication, those high on defensive pessimism, compared to those high in optimism, were lower on anxiety, higher on course satisfaction and motivation (Gibbons, 2023).

Both optimists and extraverts tend to use other cognitive and emotional strategies. They are more emotionally expressive and have higher self-confidence and there is efficacy for both of these attributes (Pennebaker & Chung, 2007; Gibbons & Morgan, 2015). Optimists tend to reframe threats as challenges and reframe failure or mistakes as opportunities to learn, rather than dwell on any associated disappointment or negative emotions (Lazarus & Folkman, 1987; Seligman, 2008).

Aims and hypotheses

The study explored three aims: the influence of student stress, rated as hassles and uplifts, on anxiety and learning motivation, along with the coping influence of support, hardiness and personality. The second aim sought to compare defensive pessimism against other traits associated with good coping, on learning motivation, and to identify not just those aspects of personality characteristic in those who cope better but to identify the coping factors they use.

The final aim explored how coping influences might mediate between sources of stress and anxiety and sources of stress and learning motivation.

H1: There will be correlations between sources of stress, support, hardiness and personality (optimism, defensive pessimism, the Big Five) on anxiety.

H2 There will be correlations between sources of stress, support, hardiness and personality on learning motivation.

H3 Participants in the upper-quartile on traits associated with either low anxiety or high motivation, will score higher on hardiness, support, and cognitive and emotional coping strategies compared to participants in the lowest-quartile.

H4 There will be no difference in learning motivation between those high in defensive pessimism and those high in other traits associated with good coping.

H5: Coping influences will mediate between sources of stress and anxiety.

H6: Coping influences will mediate between sources of stress and learning motivation.

Methods

Design

A survey-based, correlational design was employed. The predictor variables were: course-related demands (rated as hassles *and* as uplifts), amended from the National Student Survey. The coping influences measured were support, hardiness, the Big five, optimism and defensive pessimism and a series of cognitive and emotional coping strategies. The outcome variables for the regression analyses, were anxiety and learning motivation.

Participants

A sample of 184 university students (92% of the cohort) were recruited from the second year of a psychology BSc programme. On demographics, 83.7% were female (n = 154) and 13.6% male (n = 25). Participants' average age was 20.5 years (SD = 2.93 and range 18–44 years). The inclusion criteria were second year students because they had sufficient experience to rate the different sources of stress but not the added weighted demands experienced in the final year.

Materials

Students completed an 84-item online survey. It included a brief and instructions and gathered information on demographics; sources of student stress, coping influences, anxiety and learning motivation. The α for all measures ranged from .60 – .90. A 5-point Likert 'Strongly Agree' to 'Strongly Disagree' response scale was used unless otherwise stated.

The National Student Survey (NSS) (HEFCE, 2017)

NSS items were adapted with participants rating each demand twice on a 5-point scale, from 'no hassle' and 'no uplift' (0), up to 'strong hassle' and 'strong uplifting' experience (5). A range of factors were measured across 25 items, such as teaching demands, time management and support. An example item is:

Hassle		Uplift
0–5	Item	0–5
	The comprehensibility of the material taught on the course.	

An example *Learning motivation* item is: 'I have found the course motivating'.

The Values in Action (VIA) scale (Seligman, Park & Peterson, 2005)

The eight-item hope/optimism sub-scale from the longer VIA scale was used to measure levels of optimistic thinking. A sample item is: 'I always look on the bright side'.

Defensive pessimism scale (Norem & Cantor, 1986)

This is a twelve-item scale, using a 7-point response scale from 'Not at all true of me' (1) to 'Very true of me' (7). A sample item is: 'I often start out expecting the worst, even though I will probably do okay'.

The Academic Hardiness Scale (Creed, Conlon & Dhaliwal, 1992)

This scale was adapted and included 9 items. Three measured commitment e.g. 'I take my work seriously as a student'; three measured challenge e.g. 'Difficult classes are the best way to improve one's knowledge'; and three measured control. A sample item is: 'I become less motivated when I don't get the grades I want right away'.

Big Five Inventory – 10 (BFI-10) (Rammstedt & John, 2007).

Respondents are asked to rate ten statements that describe personality. A sample item is: 'I see myself as someone who is reserved'. Two items measured each trait.

Hospital Anxiety and Depression Scale (HADS) (Zigmond & Snaith, 1983).

The seven-item anxiety sub-scale was used. Respondents rate each on a scale from 0–3, where 0 is "not at all" and 3 is "most of the time". A sample item is: "I feel tense or wound up". This test is widely used in non-clinical settings (Gibbons, 2005).

Cognitive and emotional strategies associated with coping.

The author developed a 12-item scale to measure the range of cognitive and emotional strategies commonly employed by those more likely to succeed. Two items measured each of six strategies, some referred to reframing, such as: 'I always try to put my disappointments into perspective'. Some to building confidence, such as: 'It is important to reflect on one's successes'; some to defensive optimism e.g. 'When I have no control, I try to find something good to reflect on'; some to expressing emotions e.g. 'I usually find constructive ways to express my emotions' and some to adopting a growth mindset e.g. 'I always learn from my mistakes'. Items also measured age, gender and year of study.

Ethics and Procedure

The cohort was made aware of the study via email and in links on their course homepage. The study received approval from the Ethics committee at the host university. All participants received a brief and a point of contact for further clarifications. All were informed that participation was voluntary and they

were free to stop at any time and all acknowledged informed consent before participating. All ethical considerations and methods were executed in accordance with the Declaration of Helsinki.

Data analysis with 2024 stress, coping and wellbeing survey

Results

To flag possible mediators, the predictors were entered in blocks: the sources of stress entered in block one; the influences on coping – support rated as an uplift, academic hardiness, and personality (the Big Five, optimism and defensive pessimism), in block two. There was evidence of mediation with anxiety but none with learning motivation.

Table 1
Multiple regression with anxiety

Unstandardized Coefficients		**Standardized Coefficients**	
B	Std. Error	β	
(Constant)	6.35	2.29	
Hardiness - control	− .38	.09	− .22***
Extraversion	− .51	.14	− .21***
Neuroticism	.43	.13	.20***
Defensive pessimism	.16	.02	.40***
****$p < .001$			

The R^2 explained 55.2% of the variance and the Adjusted R^2 explained 54.2% of the variance in scores on anxiety. The results of the analysis offered support for H1.

Mediation analysis

For anxiety, all the predictors entered in block two (Table, 1), were significant and were therefore tested as possible mediators with peer support – this was significant in block one but not in block two in earlier iterations of the model. Extraversion and neuroticism were found to act as mediators between the hassle ratings given to peer support and anxiety:

There was a positive relationship between the hassle ratings given to peer support and anxiety (the unmediated path in Table 3). However, this relationship was no longer significant (the mediated path) when extraversion was tested as a mediator and again when neuroticism was tested.

Table 2
Unmediated and mediated values between 'hassle' ratings of peer support and anxiety

For extraversion as the mediator		
	β value	*p* value
Unmediated path	.223	.002
Mediated path	.116	.089
For neuroticism as the mediator		
Unmediated path	.223	.002
Mediated path	.099	.134

The results offered support for H5. There was no mediation evidence with learning motivation – H6 is not supported.

Table 3 compares extraverts, those in the upper quartile on the extraversion measure, against introverts, those in the lowest quartile, on support, hardiness and the cognitive strategies associated with coping:

Table 3 *Descriptive and inferential statistics on differences in hardiness, support and cognitive strategies between extraverts and introverts*

	Personality	Mean	Std. Deviation	*t*	Cohen's *d*
Hardiness control	Extraverts	8.18	1.90	3.14***	.64
	Introverts	6.83	1.83		
Hardiness commitment	Extraverts	12.10	2.28	1.44	.29
	Introverts	11.40	2.53		
Hardiness challenge	Extraverts	6.57	2.23	.10	.02
	Introverts	6.61	1.73		
Tutor support hassle	Extraverts	3.45	3.45	.599	.12
	Introverts	3.13	2.63		
Tutor support uplift	Extraverts	6.57	2.72	.353	.07
	Introverts	6.77	2.67		
Peer support hassle	Extraverts	2.94	2.75	2.08	.42
	Introverts	4.17	3.07		
Peer support uplift	Extraverts	7.22	2.54	3.75***	.76
	Introverts	5.13	2.96		
University support hassle	Extraverts	4.02	2.57	.38	.08
	Introverts	4.44	2.46		
University support uplift	Extraverts	5.33	2.73	.20	.04
	Introverts	5.22	2.25		
Coping: Self-forgiveness	Extraverts	6.82	2.06	4.94***	1.00
	Introverts	4.85	1.84		
Coping: confidence	Extraverts	8.12	1.60	1.58	.32
	Introverts	7.63	1.50		
Coping: defensive optimism	Extraverts	7.90	1.70	7.12***	1.44
	Introverts	5.29	1.90		
Coping: reframing	Extraverts	8.04	1.55	4.85***	.98
	Introverts	6.40	1.78		

Table 3 *Descriptive and inferential statistics on differences in hardiness, support and cognitive strategies between extraverts and introverts*					
Coping: expressing emotions	Extraverts	6.61	1.76	3.18***	.63
	Introverts	5.41	2.00		
Coping: growth mindset	Extraverts	7.14	1.54	2.67***	.54
	Introverts	6.27	1.67		

$p < .003$***. The alpha coefficient was set to $p < .003$ as a correction for running multiple *t* tests on the differences in coping influences between introverts and extraverts.

Extraverts were higher on aspects of hardiness and support and on most of the emotion and cognitive coping strategies. This offers support for H3.

Table 4
Regression analysis with learning motivation

		Unstandardized Coefficients		Standardized Coefficients
		B	Std. Error	Beta
1	(Constant)	2.57	.78	
	Teaching Experience Uplift	.28	.06	.30***
	Learning Opportunity Hassle	− .16	.06	− .17**
	Peer Support Uplift	.11	.04	.16**
	Assessment and Feedback Uplift	.16	.05	.20**
	Hardiness - Commitment	.14	.05	.18**
$p < .01$**$p < .001$				

The R^2 explained 31.9% of the variance and the Adjusted R^2 explained 29.9% of the variance in scores on learning motivation. The results offered support for H2.

In testing H4, no personality traits made the final model with learning motivation but extraversion and defensive pessimism did in the regression with anxiety. Extraversion was associated with low anxiety, indicating it is associated with good coping, and defensive pessimism with high anxiety. However, there was no difference between the upper quartile on extraversion ($M = 7.07$, $SD = 2.06$) and the upper quartile on defensive pessimism in learning motivation ($M = 6.6$, $SD = 1.88$), $t(60)$, .865, $p = .196$, with a small effect size $d = .25$. No difference was reported between those high in defensive pessimism and the cohort average on learning motivation ($M = 6.6$, $SD = 1.88$), $t(19)$, 1.193, $p = .248$, with a small effect size $d = .27$. Those high in extroversion were higher than the cohort average on learning motivation ($M = 7.07$, $SD =$ 1.87), $t(41)$ 3.049, $p = .004$, with a small effect size $d = .471$. The results offer support for H4.

Discussion

The regression model with anxiety

Four significant predictors were reported in the regression model in Table 1. As defensive pessimism increased, so did anxiety. This suggests those more anxious are more likely to use defensive pessimism and Norem and Canter (1986) argue it is effective for those anxious prone and who have tended to do well in the past. It is a cognitive strategy to reduce the pressure to achieve by setting the bar low on one's expectations. To test its efficacy, those high in defensive pessimism were compared against those which these research findings suggest cope well. In this case, extraverts, and there was no difference in the learning motivation between these two groups. This supports Norem and Canter (1986) and Gibbons' (2023) findings on the benefits of defensive pessimism.

Much has been made in the research literature on the merits of optimism and optimistic thinking strategies as an effective coping resource but while optimism was significant as bi-variate correlations with both outcome measures, it did not make the final regression models and its efficacy is not supported.

Hardiness-control was negatively associated with anxiety, suggesting it was an effective coping strategy. One of the items states: 'If I get behind, I panic and feel ill'. This suggests it is a coping mechanism adopted as a compensation for managing the anxiety associated with feeling out of control if, for example, one falls behind in one's studies. It also measures a student's ability to bounce back from academic mistakes and to remain motivated in the face of disappointing results.

Hardiness-control is associated with higher class attendance, being diligent and pro-active in notetaking, in engaging with learning material and with an increased effort to try and take ownership of the learning points made in class. It is reflected in not being held back by learning disappointments but instead, homing-in on what one can learn from feedback to improve in the next assessment (Creed et al., 2013; Daneshamooz & Alamolhodaei, 2012; Spiridon & Evangelia, 2015).

The results point to the value for students in harnessing control, irrespective of where one would score on dispositional control i.e., hardiness-control measures a type of coping one can improve in. Indeed, it seems that those high on this type of control have developed it as a compensation to the anxiety triggered by feeling out of control. It should come as consolation to students that experiences of feeling overwhelmed and out of control can trigger better coping.

High scores on extraversion were associated with low scores on anxiety. While extraversion is a trait, there is strong evidence that one can 'act' more extraverted, irrespective of one's disposition and even where it has been done for brief periods, it has been associated with improved wellbeing (Jacques-Hamilton, et al., 2019; Margolis & Lyubomirsky, 2020). In a learning context, this could be by taking on some aspect of a presentation or taking the lead in a group project or by offering to be the researcher running an experiment or by forming a study-buddy group or by joining a club or society and, more simply, by just

engaging more with others. Such initiatives require the appearance of extraversion to some degree and meeting a new group means there is no pressure to fit in with past expectations. It's an opportunity to experiment and be different, including feigning extraversion for brief periods. Such initiatives are likely to have beneficial effects.

A positive relationship was found between neuroticism and anxiety. This is no more ominous than saying those worry-prone tend to be more anxious. To truly grow and learn as a student in higher education, one has to recognize that some periods of anxiety are inevitable. The challenge is managing this and these results suggest that employing defensive pessimism, developing control and 'feigning' or acting in more extraverted way are likely to help. The support element, that is often linked to extraverts' coping success, suggests that students who network and build support among peers and who utilize what the university has to offer by way of support, benefit.

Mediation analysis

Both mediations, Figs. 1 and 2 and Table 2, illustrate a positive relationship between support rated as a hassle and anxiety. However, when extraversion and neuroticism are separately tested as mediators, this relationship was no longer significant. Higher scores on extraversion were associated with lower hassle ratings given to peer support. It is likely that those, more extraverted, cope better and have a larger pool of support on which to draw. This means that more support and more diverse support is available to them, for example, to meet emotional, instrumental and practical needs. So, if some peers are not particularly helpful there are others one can draw on and, when one is coping well, new stress demands are perceived as less threatening. This may explain the negative relationship between extraversion and peer support rated as a hassle and extraversion and anxiety and the positive relationship when the mediator was neuroticism not extraversion.

Those scoring high on neuroticism are more worry-prone. The impact of stress demands is more anxiety inducing and perhaps especially if it is the support one hoped would help but which proved disappointing. Those high on neuroticism have a lower threshold before distress triggers anxiety. They are more likely to perceive that they are not coping well because of their anxiety and this means that new stress demands are more readily perceived as threatening.

To test H3, those in the upper quartile and lowest quartiles on extraversion i.e. extraverts and introverts, were compared on hardiness, support ratings and the cognitive and emotional coping strategies. Extraverts were higher, with moderate to large effect sizes, on hardiness-control, peer support rated as an uplift, on self-forgiveness, defensive optimism, reframing, expressing emotions and in exhibiting a growth mindset.

Extraverts were more likely to see the value in peer support and to rate it as more uplifting. They took opportunities to harness control as a student, to not dwell on disappointments, and to home-in on the positives in situations outside their control, for example if classes are cancelled or moved online; to reframe feedback to maximise what can be learnt from it and to find constructive ways to express

emotions. This supports the earlier findings on uplifting ratings on support (Gibbons, 2008, 2009); on the value of being emotionally expressive (Pennebaker & Chung, 2007) and on reframing and defensive optimism (Seligman, 2008).

Regression analysis with learning motivation

In relation to the analysis with learning motivation, Table 4, the more teaching experiences were rated as uplifting, the higher were scores on learning motivation. This reflects the efforts and success by faculty to create a rich and stimulating learning environment. Typically, students will experience a variety of teaching styles and learning activities. Some will be rated as effective, even inspiring but there, inevitably, will be a mix. It is a testament to the faculty in this school that 'teaching experience', rated as an uplift, was the strongest predictor of learning motivation. Regressions are, of course, a type of correlation and it is likely that students who have mastered key elements in being an effective learner are likely to be more motivated and to get more out of a teaching experience, making it more likely they will rate it as uplifting.

Similar factors may explain why assessment and feedback, when rated as an uplift, correlated with learning motivation. The school recently moved to standardising how feedback was given, with a focus on 'strengths'; the 'areas to improve' and 'how'. Assessment deadlines are closely monitored to ensure deadlines are staggered and students, in this cohort, benefitted from the introduction of a two-week, non-teaching assessment period midway through each semester to focus solely on assignments.

Students meet their tutors fortnightly to engage in small group teaching and they meet them individually, once per semester, to monitor progress, with a focus on reflecting on feedback in relation to upcoming assessments. These initiatives help students in their organisation, time-management, in learning from feedback and in developing key skills to improve.

Where learning opportunities were rated as a hassle, it was negatively related to learning motivation. This is at odds with the explanation offered on assessment and feedback. Items that measure this referred to the opportunity to explore ideas and concepts and the extent to which the course built on what a student already knew. Any programme of study is a work in progress and there may be a legitimate perception that some aspects of delivery could be improved. However, both hassle and uplifting ratings could be interpreted through the lens of positive psychology: That is, to grow, one has to move out of one's comfort zone. This means learning will, at times, be hard, may be perceived as 'too hard'. Maftei, Dumitriu and Holman, (2021), find, for example, that most students who succeed in university, report experiencing imposter syndrome at different periods during their studies. These hassle ratings may reflect the necessary stress associated with growth.

Hardiness-commitment positively correlated with learning motivation. This refers to the personal sacrifices and hard work a student engages in to achieve and the extent to which they take their studies seriously. It is a similar attribute to conscientiousness but in a learning context. For Maddi (2002), hardiness is a quality or set of attitudes that we can be developed and it becomes a virtuous circle – with improved hardiness comes increased motivation, making it easier to sustain hardiness.

Finally, where peer support was rated as an uplift, it positively correlated with learning motivation. This cohort received guidance in the first two weeks of their programme on effective stress management, with a focus on the value of peer support. Several assessments are group based and while they experience small group tutorials every two weeks, a recent initiative introduced tutorials every week, one tutor-led and one self-directed. The course is designed so that each student works with several different groups: their tutor group, a different group they sit with in their lab-based teaching and different groups in assessments in other modules. In short, the cohort is aware of the value of networking and learning is organised to facilitate it. Their stress management induction outlines and the value of peer support and this usually means there is no resistance, or it is short-lived, and these study results suggest peer support reaps dividends.

Limitations

The use of a survey method and volunteer sample are not without limitations and a larger sample, across all cohorts in the department, would have allowed more insight into the different demands faced across each year. Better still would be within sample comparisons with the same cohort across their studies.

Identifying the sources and experiences of stress that are likely to enhance performance and are thereby uplifting, as opposed to a hinderance or hassle, is a key challenge i.e., the stress that helps you achieve may be experienced as unpleasant and rated as a hassle even though it is necessary to achieve. Adopting different labels for ‘hassles’ and ‘uplifts’, such as sources of stress that ‘hinder’ or are ‘necessary to facilitate’ performance might go some way, but it is likely that stress demands rated as a ‘hassle’ or ‘hinderance’ might reflect an inevitable, indeed, necessary step in learning.

Recommendations

Students high in commitment are proactive in learning and harnessing the skills and knowledge needed. In higher education, this could include the techniques involved in using a piece of software or the steps to execute a basic literature search; it could include knowledge and techniques on how to precis notes from articles and in class, on how to structure an assignment and how to search for, find and integrate critical comment into an assignment or exam question. Those high in control make it a priority to identify the skills they need to master a learning situation and they do not avoid but faceup to the inevitable challenges in learning.

Some experience of feeling out of control is unavoidable if one truly endeavours to learn and grow. Students who succeed, experience it and it is noteworthy that they may well develop hardiness-control as a *compensation* to earlier experiences that left them feeling helpless and overwhelmed.

For students who tend to get anxious but have done well in the past, defensive pessimism is a useful strategy to manage stress and motivation – those high in defensive pessimism were much higher in anxiety than those high in extraversion but there was no difference between these groups on learning motivation.

Acting in extraverted ways lowers anxiety and builds support. While those high in trait extraversion are likely to find this easier, it is relatively straightforward for all students to fake extraversion in small and subtle ways e.g., to be proactive in saying hello to someone new, to make a point of saying three things in a group discussion, to thank someone for their help, to offer help, to offer to set up a study buddy group or WhatsApp study group etc. Educators should maximise ways to encourage students to feign being more extraverted in brief warm-up exercises at the start of class.

Most programmes have students work in groups to utilise peer support. The question educators need to ask is – am I maximising the opportunities my students have to network? Peer mentoring schemes, breakfast clubs, subject societies and socials, tutor-led and tutor absent, student-led tutorials are just some ideas.

Educators could introduce or monitor stress management-based induction activities. If students are aware of those factors that can be acquired and are common to those who achieve and if they are shown how they can be developed in simple and practical ways, they are likely to embrace, at least, some of them. It is not just the value of support and networking or faking extraversion, or by employing defensive pessimism, for those anxious-prone, but it should include insight into other cognitive and emotional strategies. This could include strategies around academic hardiness, reframing challenges and disappointments, expressing emotions and adopting a growth mindset. Understanding that imposter syndrome is common and, to some degree, inevitable if one is to truly grow, will help students reframe disappointment and those occasions where ‘it all seems too hard’ and will help buffer them from the stresses they face.

Declarations

Author Contribution

Dr C Gibbons undertook all steps in the research, from ethics submission to data collection and analysis and write up.Dr Gibbons is based at Queen's University Belfast in Northern Ireland in the UK. This is his country of affiliation.

The above information is detailed in the manuscript.

Consent for publication

I give my consent for this research to be published in BMC Psychology and the manuscript is not under review elsewhere.

Availability of data and materials

The data set is available at:https://orcid.org/0000-0001-6631-721X

The question items are subject to copyright but the sources for all the measures used are referenced and interested parties can contact any of these sources. The authors vary on their decisions to make their

tests available for free for educational purposes.

Competing interests

The author has no competing interests

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Authors' contributions

Dr C Gibbons undertook all elements of this study, including questionnaire distribution, data analysis, manuscript preparation and review.

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Authors' information (optional)

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Figures

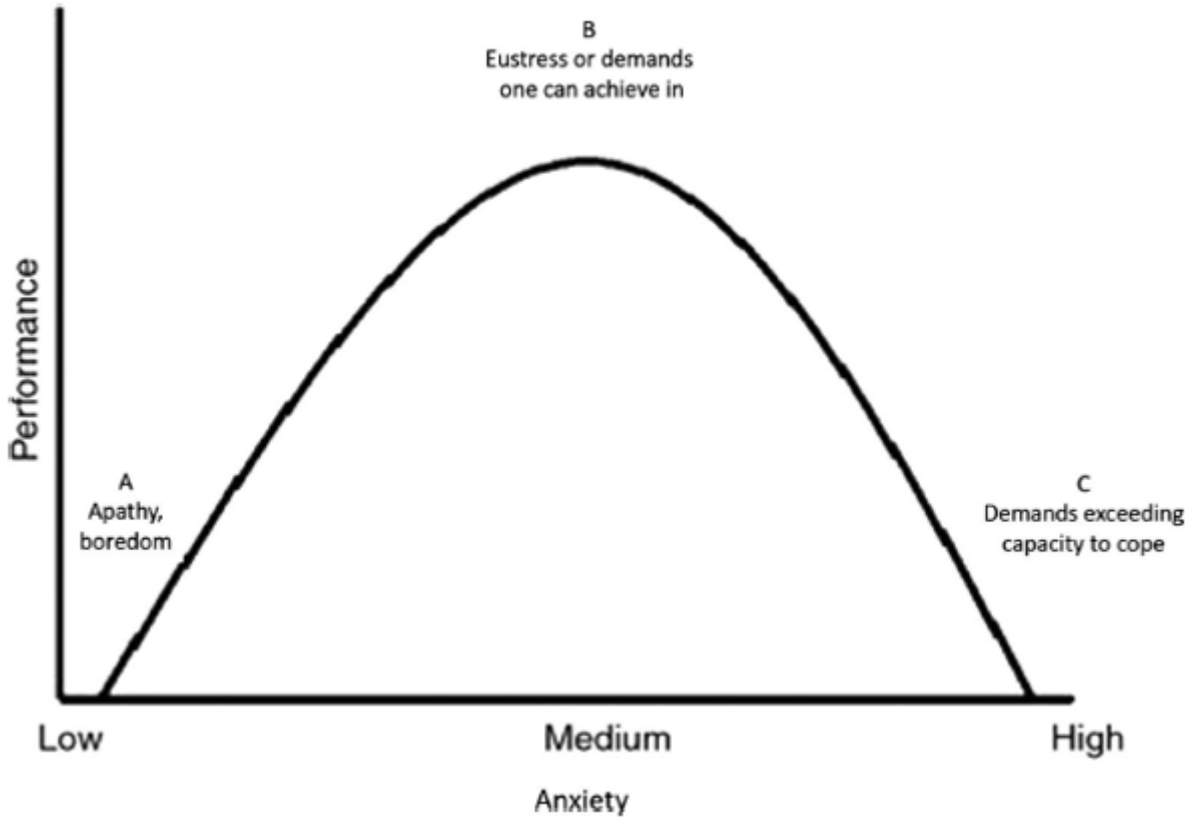

Figure 1

The curvilinear relationship between stress and performance (Gibbons, 2008)

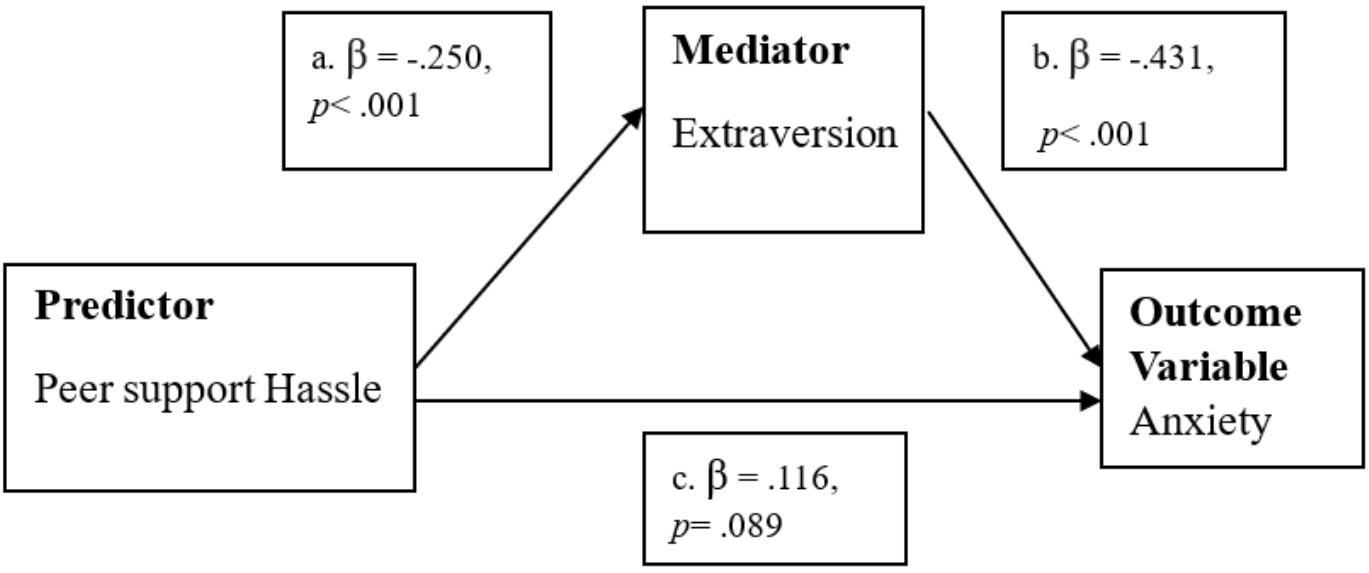

Figure 2

Figure 1. Extraversion as a mediator between 'peer support' rated as a hassle and anxiety

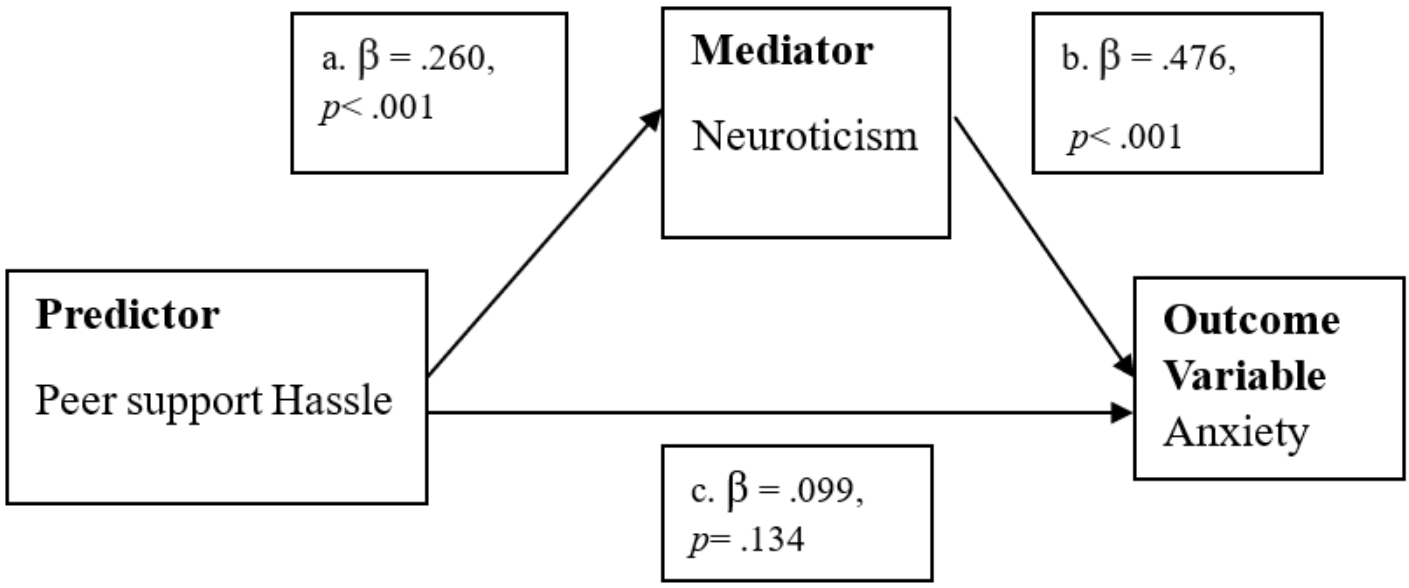

Figure 3

Figure 2. Neuroticism as a mediator between 'peer support' rated as a hassle and anxiety