Intrinsic, Extrinsic, and Amotivational Orientations: Their Role in University Adjustment, Stress, Well-Being, and Subsequent Academic Performance

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The aim of this study was two-fold; first, to examine the relationship between motivational orientations and adjustment to university, stress, and well-being in a sample of students during their second year of university and second, to assess the predictive value of motivational orientations in determining subsequent academic performance. Controlling for gender and age, amotivated behaviors led to worse psychosocial adjustment to university, higher levels of perceived stress, and greater psychological distress while studying. In contrast, intrinsically motivated behaviors (to know) were associated with lower levels of stress. In relation to academic performance, neither extrinsic or intrinsic motivation, nor amotivation were related to subsequent academic achievement. Both gender and entry qualifications were significant predictors of performance; women and those individuals with greater academic aptitude prior to entering university had higher marks. These results are discussed with reference to Deci and Ryan's (1985, 1991) self-determination theory.

INTRODUCTION

The concept of motivation can be studied from many different perspectives, one of particular relevance in the educational domain has been that postulated by Deci and Ryan (1985, 1991) which suggests that behavior can be intrinsically motivated, extrinsically motivated, or amotivated. Intrinsic motivation refers to doing an activity or behavior voluntarily for its own sake, and the inherent pleasure and satisfaction derived from participation, while extrinsic motivation refers to activities engaged in as a means to an end such as, to gain reward or avoid criticism, rather than for satisfaction of the activity itself. In contrast, amotivation refers to behaviors that are neither extrinsically nor intrinsically motivated, rather amotivated behaviors are non-regulated and non-intentional. In addition, within Deci and Ryan's framework, extrinsic motivation is not a unitary concept. They propose different types of extrinsically motivated behaviors ordered along a continuum between amotivation and intrinsic motivation, and varying in the extent to which they are self-determined; from lower to higher they are, external regulation, introjection, and identification. External regulation refers to behaviors that are perceived as non-autonomous, that is, determined solely by external forces rather than the individual. Introjected regulation refers to activities that are partly internalized through past external contingencies but not in a truly self-determined way, while identified

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regulation refers to behaviors that are judged as important for the individual, and perceived as autonomous and chosen by themselves.

In educational contexts, these motivational orientations have been associated with a range of outcomes. Intrinsic motivation has been found to contribute positively to the learning process and the quality of learning. In particular, intrinsically motivated individuals have been found to be more likely to engage deep-level study strategies (Ames & Archer, 1988), display enhanced conceptual learning (Grolnick & Ryan, 1987), creativity (Koestner, Ryan, Bernieri, & Holt, 1984) and cognitive flexibility (McGraw & McCullers, 1979), have a greater recall of learned material (Ryan, Connell, Plant, Robinson & Evans, 1984), and better academic performance (Deci & Ryan, 1985). Additionally, intrinsic motivation has been linked to enhanced self-esteem (Deci & Ryan, 1995) and general well-being (Ryan, Plant, & O'Malley, 1995). In comparison, much less research attention has been directed to the role of amotivation or the different types of extrinsic motivation in determining educational outcomes. This is because, up until recently, most studies have utilized unidimensional measures of motivation, which do not go beyond simple extrinsic/intrinsic distinctions (e.g., Intrinsic vs. Extrinsic Orientation Scale; Harter, 1981). These studies suggest that extrinsically motivated behaviors, in general, are associated with impaired learning, poorer performance, and educational outcomes (e.g., Benware & Deci, 1984; Grolnick & Ryan, 1987). However, more recent research assessing motivational orientations in a multidimensional fashion (e.g., Academic Motivation Scale; Vallerand, Pelletier, Blais, Briere, Senecal, & Vallieres, 1992) suggests that the link between extrinsic motivation and educational outcomes is complex and depends on the type of extrinsically motivated behaviors assessed (Vallerand & Bissonnette, 1992; Vallerand, Blais, Briere, & Pelletier, 1989; Vallerand et al., 1992; Vallerand, Fortier, & Guay, 1997). In these studies, both intrinsic motivation and more autonomous or self-determined types of extrinsic motivation (identified regulation) were associated with lower dropout rates and more persistence, while non-self-determined types of extrinsic motivation (external, introjected) and amotivation were negatively related or not related to such outcomes.

The results of such studies support the notion proposed within self-determination theory (Deci & Ryan, 1985, 1991) that extrinsic and intrinsic motivational processes are not necessarily antagonistic, rather it is the extent to which behaviors are self-determined or autonomous, as opposed to controlled from external forces, that may be important in terms of educational consequences. However, what is not clear at present is the precise nature of the relationship between different motivational orientations and academic performance. This is because studies by Vallerand and colleagues employed educational outcome measures such as perceptions of competence, concentration, time spent studying, and drop out rates, as opposed to actual academic performance. One aim of the present study was to assess the precise nature of the relationship between different motivational orientations and performance in a tertiary educational setting utilizing a prospective design, while controlling for individual's academic aptitude prior to entering university.

While considerable research effort has examined the link between motivation and cognitive (e.g., effort, concentration) and behavioral consequences (e.g., persistence) in educational settings, no study has so far assessed the role of different motivational

orientations in relation to other factors important for academic success such as, adjustment to university, stress, and health. There is extensive evidence to suggest that university can be stressful for many students, entailing a great deal of adjustment to a range of interpersonal, social, and academic demands and situations (e.g., Dunkel-Schetter & Lobel, 1990). Poor adjustment to university and associated difficulties has been shown to impact on physical and psychological health (Aspinwall & Taylor, 1992; Fisher & Hood, 1987) and university attrition (Daugherty & Lane, 1999), as well as contribute to poor academic achievement (Baker & Siryk, 1984; Sharma, 1973). Many factors thought to influence adjustment to university have been studied including age, sex, and nationality (Chataway & Berry, 1989; Hull, 1978), university entry qualifications and intellectual ability (Aspinwall & Taylor, 1992; Sternberg & Kaufman, 1998), personality variables such as shyness (Joiner, 1997), extraversion and neuroticism (Halamandaris & Power, 1999; Lu, 1990, 1994) and other vulnerability factors such as, positive and negative affect (Joiner, 1997) and social support (Halamandaris & Power, 1999). Many of these studies, however, define adjustment in relation to academic performance. While academic success is a part of adjustment to university, it also includes psychosocial aspects such as interpersonal and social adjustment. Related to this, most of these studies have tended to examine key outcome variables such as, adjustment, stress, health, or performance in relation isolation. To date, there have been few studies that have investigated the complexities of such variables simultaneously. Finally, there have been no studies of the importance of motivational orientations in adjustment to university, levels of stress, and psychological health outcomes; yet, motivational orientations, the *why* of behavior (Deci & Ryan, 1985), in this case reasons for studying, may have a significant impact on how students' adjust to the academic, social and interpersonal demands of university, levels of stress experienced, and associated health outcomes. Indeed, motivation research in real-life domains other than education indicates that self-determined motivation is associated with positive affective outcomes such as psychological adjustment and satisfaction (Deci & Ryan, 1985, 1991).

The present study was designed to allow an examination of the relationships between motivational orientations and a range of factors important for success at university; adjustment, stress, well-being, and subsequent performance while controlling for the influence of demographics (age, gender) and initial academic aptitude. The study had two aims: (1) to investigate the degree to which different motivational orientations predict adjustment, stress, and well being in individual's second year at university and, (2) to assess whether different motivational orientations predict subsequent academic performance achieved during students' second and third years at university.

METHOD

Participants

Participants were 91 second-year psychology undergraduates (71 women, 20 men) enrolled at a medium-sized campus-based university during the period 1998-2001 (70% response rate). Ages ranged from 18 to 36 years (M = 19.46, SD = 3.08).

Measures

Academic Motivation. The academic motivation scale (AMS; Vallerand et al., 1992) was used to assess student's motivation to succeed at university. The AMS is a 28-item measure of motivation based on the theoretical model of motivation postulated by Deci and Ryan (1985). The scale has seven sub-scales assessing three types of intrinsic motivation (intrinsic motivation to know, to accomplish things, and to experience stimulation), three types of extrinsic motivation (external, introjected, and identified regulation), and amotivation. Respondents are asked to rate each item on a 7-point scale (1=*does not correspond at all,* 7=*corresponds exactly*) to the extent to which it corresponds to the reasons why they are at university. The AMS is scored for each of the seven sub-scales with higher scores indicating greater intrinsic, extrinsic, and amotivation. Previous studies using the AMS reveal high internal ($\alpha = .81$) and test-retest reliability ($r = .79$) (Vallerand et al., 1989, 1992). In order to reduce the total number of predictors in the present study and given the high intercorrelations between some of the subscales of the AMS (see Table 1), scores for the questionnaire were factor analyzed by means of principal component analysis. The results indicated a three-factor solution. As expected, the three intrinsic motivation subscales loaded on the first factor (IM), the three extrinsic motiva-

TABLE 1

Means and Intercorrelations for the Seven Motivational Orientation Subscales

Variable	1	2	3	4	5	6	7
1. IMTK	-	.60***	.76***	.22*	.10	-.14	-.37***
2. IMTA		-	.61***	.28**	.41***	-.04	-.17
3. IMES			-	.17	.22*	-.09	-.20*
4. EMID			-	.32**	.45***	-.21*	
5. EMIN				-	.38***	.12	
6. EMER						-	-.05
7. AMOT							-
Mean	19.40	15.62	13.96	21.34	18.71	19.59	8.02
SD	4.72	4.69	4.65	4.47	4.82	5.40	5.04

Note: IMTK, IMTA, IMES=Intrinsic motivation to know, to accomplish, to experience stimulation; EMID, EMIN, EMER=Extrinsic motivation identified, introjected, externally regulated; AMOT=amotivation. * $p < .05$, ** $p < .01$, *** $p < .001$

tion subscales on the second factor (EM), and amotivation on the third factor (AM). The variance explained by the three factors was 78.1%.

Psychological Well-Being. The 12-item General Health Questionnaire (GHQ-12; Goldberg, 1972) was used to assess psychological well-being. Respondents rate how much they agree with each statement, with a higher score indicating greater self-reported psychological distress. Cronbach's alpha ranges from 0.82 to 0.90 in a series of studies reported by Goldberg and Williams (1988).

Adjustment to University. The College Adaptation Questionnaire (CAQ; Crombag, 1968; Vlaander & van Rooijen, 1981) was used to assess participants' psychosocial adjustment to university. The CAQ consists of 18 statements scored on a 7-point scale. Ten of the items reflect poor adjustment (e.g., "I find it hard to get used to life here") and eight items reflect good adjustment (e.g., "I am glad that I came to study here"). The score for the CAQ is the sum of the item scores after reflection of the ten items indicating poor adjustment. Previous studies have reported the CAQ to be highly reliable, $\alpha = 0.83$ (van Rooijen, 1986).

Stress. Perceived stress was assessed using the Perceived Stress Scale (PSS-4; Cohen, Kamarck, & Mermelstein, 1983). The PSS-4 consists of four items rated on a 4-point scale (0=*never,* 4=*very often*), with a higher score indicating greater perceived stress. Previous studies indicate the scale has good reliability, $\alpha = 0.73$ (Aspinwall & Taylor, 1992).

Academic Performance. Two measures of academic performance were obtained from the departmental database. The first, entry qualifications (EQ) represented respondent's A-level point average gained prior to their entry to university and was obtained to control for respondent's previous academic performance. The second measure represented respondent's grade point average (GPA) for the eight modules taken in their second and third year at university.

Procedure

Questionnaires were distributed to all psychology students during the second semester of their second year at university. Participants were given the questionnaire during scheduled classes after having been informed about the nature and aims of the study, and assuring them that all responses were confidential. Participants completed the questionnaire during the class, and when completed returned them to a collection box. Respondents were asked to provide their student identification numbers in order to allow matching of questionnaires with academic performance data. Participants received no incentives (course credits or payments) for taking part in the study. Following the second semester of students' third year of study (14 months from Time 1), participants' entry qualifications and academic performance data were obtained from the departmental database.

Overview of Analysis

In order to assess the relationships between motivational orientations, adjustment, well-being, stress and subsequent academic performance, a series of hierarchical

multiple regression analyses were performed. In all analyses, age and gender were entered as the first step to control for demographics. The three AMS factors (IM, EM, AM) were then entered as the second step for the analyses of stress, adjustment and well-being. For the analysis of academic performance, entry qualifications were entered prior to the motivational factors in order to control for initial academic aptitude. In all analyses, where the intrinsic, extrinsic or amotivation factors were significant predictors, further exploratory regression analyses were conducted entering the relevant motivational orientation subscales (e.g., intrinsic motivation to know, extrinsic motivation-external) in a stepwise incremental fashion in order to explore the relationship between specific motivational orientation dimensions and outcome variables.

RESULTS

The means, standard deviations and ranges for all study variables are presented in Table 2, and intercorrelations between study variables in Table 3. As can be seen, intrinsic motivation was positively related to adjustment (CAQ) and negatively related to self-reported stress (PSS). The opposite relationships were observed in relation to amotivation, indicating that higher amotivation and lower intrinsic motivation scores were associated with greater self-reported stress and poorer adjustment to university life. In relation to well-being, greater psychological distress, as measured by the GHQ-

TABLE 2

Means, Standard Deviations, and Ranges of All Study Variables

Variable	Mean	*SD*	Range
Motivation (AMS)			
Intrinsic motivation	16.32	4.12	6.67-26.33
Extrinsic motivation	19.88	3.77	7.67-27.33
Amotivation	8.02	5.04	4-25
GHQ-12	13.92	5.41	6-42
CAQ	88.37	16.85	50-120
PSS	6.59	2.97	0-13
GPA	58.08	5.43	43.18-70.67
EQ	21.73	10.69	0-40

Note: AMS=Academic Motivation Scale; GPA=Grade Point Average; EQ=Entry Qualifications; PSS=Perceived Stress Scale; CAQ=College Adjustment Questionnaire; GHQ-12=General Health Questionnaire

TABLE 3

Intercorrelations between Study Variables

Variable	1	2	3	4	5	6	7	8
1. IM	-	.17	-.28**	.28**	-.31**	.04	.00	-.13
2. EM		-	-.05	.04	.01	-.01	-.06	.19
3. AM			-	-.63***	.32**	.28**	-.06	-.07
4. CAQ				-	-.57***	-.19	.03	.08
5. PSS					-	.23*	.07	.19
6. GHQ-12						-	.06	.10
7. GPA							-	.27*
8. EQ								-

Note: IM=Intrinsic Motivation, EM=Extrinsic Motivation, AM=Amotivation. See Table 2 for remaining abbreviations. * $p < .05$, ** $p < .01$, *** $p < .001$

12, was related to higher amotivation scores. No significant relationships emerged between extrinsic motivation and adjustment, stress, or well-being. Academic performance (GPA) did not show any significant relationships with motivational orientations, while GPA was positively related to the measure of academic aptitude prior to arrival at university (EQ).

As can be seen in Table 4, amotivation was a significant predictor of adjustment, stress and well-being as measured in this study. After controlling for age and gender, amotivation accounted for an additional 42% and 11% of the variance in self-reported adjustment and psychological well-being scores respectively. Together with intrinsic motivation, amotivation accounted for 17% of the variance in perceived stress scores. Examination of the direction of the beta coefficients indicates that individuals who had higher amotivation scores reported poorer adjustment to university and higher psychological distress compared to those with lower amotivation scores, while greater amotivation together with lower intrinsic motivation were predictive of greater self-reported stress.

To assess which of the intrinsic motivation subscales contributed most to the relation between intrinsic motivation and stress, a further stepwise regression analysis was conducted entering each of the three intrinsic motivation subscales in an incremental fashion. The results of this analysis indicated that intrinsic motivation to know contributed most to this relationship (Fchange (1, 87) = 11.34, p = .001) accounting for 10% of the variance in self-reported stress above and beyond that accounted for by demographics. The direction of the beta coefficient indicated that individuals with lower intrinsic motivation to know scores had higher levels of self-perceived stress.

TABLE 4

Hierarchical Regression Analyses Predicting Adjustment to University, Health, Stress, and Academic Performance from Motivational Orientations

Variables		Beta	R	R^2	*F*	R^2change	*F*change
Adjustment (CAQ)							
Step 1							
Gender		-.13					
Age		.08	.14	.02	0.82		
Step 2							
Motivation[1]	AM	-.61***	.66	.44	13.11***	.42	20.94***
Stress (PSS-4)							
Step 1							
Gender		-.04					
Age		-.32**	.29	.08	4.03*		
Step 2							
Motivation[1]	AM	.31**					
	IM	-.21*	.51	.26	5.84***	.17	6.54***
Health (GHQ-12)							
Step 1							
Gender		.02					
Age		-.17	.12	.01	0.63		
Step 2							
Motivation[1]	AM	.35**	.35	.13	2.42*	.11	3.58*
Performance (GPA)							
Step 1							
Gender		.30**					
Age		.12	.21	.04	2.03		
Step 2							
EQ		.41***	.39	.15	5.03**	.10	10.62**
Step 3							
Motivation[1]		-	.42	.18	3.05*	.03	1.05

Note: see Tables 2 & 3 for abbreviations. *$p < .05$, ** $p < .01$, *** $p < .001$

[1]significant factors only

In relation to academic performance, none of the motivational orientations were significant predictors of students' academic achievement at university. Gender and entry qualifications were significantly related to academic performance, accounting for 4% and 10% of the variance respectively. Examination of the beta coefficients indicates that women, and those individuals with higher entry qualifications, obtained higher marks during their second and third years at university.

DISCUSSION

Within self-determination theory (Deci & Ryan, 1985, 1991), amotivation refers to the absence of motivation. For those individuals who report high levels of amotivation, behaviors are non-regulated and non-intentional. Such behaviors may result from feelings of not being able to complete an activity successfully (Bandura, 1986), not expecting an activity to yield a desired outcome (Seligman, 1975), or not valuing a particular activity (Ryan, 1995). With no sense of purpose or expectation of changing events, over time, such individuals are likely to experience increased feelings of incompetence and uncontrollability; a state proposed as similar to that of learned helplessness (Seligman, 1975). In the present study, such amotivated behaviors were associated with a number of negative outcomes; poor psychosocial adjustment to university life, high levels of perceived stress, poor general well-being. Such findings support previous studies which have found amotivation to be strongly linked to educational outcomes such as, decreased perceptions of competence and concentration (Vallerand et al., 1989) and, more generally, to negative affect and lowered self-esteem (e.g., Peterson & Seligman, 1984 for a review).

In this particular sample of students, it was amotivation, or the absence of motivation, that had the most significant impact on affective outcomes, as opposed to either intrinsically or extrinsically motivated behaviors. It had been expected based on Deci and Ryan's (1985, 1991) theory and previous research in educational settings (Vallerand & Bissonnette, 1992; Vallerand et al., 1992, 1997), that higher forms of self-determined motivation (intrinsic motivation, identified extrinsic motivation) would be associated with positive consequences. In this study, only one type of intrinsic motivation—intrinsic motivation to know—was significantly related to any of the outcome variables. Within self-determination theory, intrinsic motivation to know refers to performing activities for exploration, and the pleasure and satisfaction experienced while learning, and is related to global constructs such as the search for meaning (Vallerand et al., 1989, 1992). In the present study, such intrinsically motivated behaviors were linked to lower perceived stress scores while studying. However, such behaviors were not predictive of better psychosocial adjustment to university life or greater levels of perceived well-being.

One explanation for why amotivation had such a negative impact on adjustment, stress, and well-being, and intrinsic motivation and more self-determined types of extrinsic motivation had few positive consequences, may be in terms of the levels of these motivational orientations in the present sample. In comparison with previous studies with Canadian students (e.g., Vallerand et al., 1992), students in the present study had higher levels of amotivation and lower levels of self-determined motivation (intrinsic motivation to accomplish). As proposed in cognitive evaluation theory, a subset of self-determination theory, one factor known to influence motivation is level of autonomy (Deci & Ryan, 1985, 1991; Ryan & Deci, 2000a & b). When applied in the educational domain, the theory suggests that when students are supported (by parents, teachers) in being autonomous in respect to choices and decisions about their studies, they develop high levels of intrinsic motivation and low levels of amotivation. In contrast, when

students perceive they have little control over what to do and how to do it, self-determined motivation is undermined. Past evidence suggests that levels of autonomy support and opportunities for self-direction from teachers can impact on educational outcomes such as, dropping out in high school (Vallerand et al., 1997) and perceived competence (Guay, Boggiano, & Vallerand, 2001) via changes in intrinsic motivation. Various social-contextual events have been found to decrease feelings of autonomy for example, the use of extrinsic rewards such as grades (Grolnick & Ryan, 1987). According to Ryan and Deci (2000a & b), the reliance of grades as the sole measure to improve student's performance, as seen increasingly within the British university system, may lead to a decrease in intrinsically motivated behaviors and enhanced amotivation, within a non-autonomy supportive environment. Thus, it may be that the general climate in the university in which this study was based acted to increase amotivational behaviors that, in turn, were associated with poor outcomes. Conversely, in other universities, which allow greater autonomy in choices and decisions, together with less emphasis on extrinsic rewards, such motivational-outcome relationships may not exist.

However, such an interpretation would also predict an association between heightened amotivated behaviors and poor academic performance, a relationship not present in this study. Indeed, none of the motivational orientations were related to academic performance. Such findings are contrary to research that suggests self-determined types of motivation lead to enhanced persistence, creativity and problem-solving, all factors linked to successful academic performance, while non self-determined types of motivation (e.g., external regulation, amotivation) are associated with negative outcomes (e.g., Deci & Ryan, 1985; Vallerand, 1997). Only direct effects were examined in this study. It might be that motivational orientations had indirect effects on students' performance via levels of adjustment or perceived stress while studying. For example, high levels of self-determined motivation, and associated feelings of competence and control, led to lower levels of perceived stress that may, in turn, have impacted on academic commitment and achievement. Such an explanation is in accordance with the finding that higher levels of self-determination (intrinsic motivation to know) were related to lower levels of stress in this study, while amotivation was associated with worse adjustment, greater perceptions of stress, and higher levels of psychological distress. Furthermore, previous findings that psychosocial adjustment is associated with lower university attrition (Daugherty & Lane, 1999) and better performance (e.g., Sharma, 1973), and research within the wider stress literature which suggests that the presence of actual or perceived control is associated with decreased stress and better health outcomes (e.g., Steptoe & Appels, 1989), would also provide support for such an explanation. Given that indirect effects were not assessed in this study, it remains for future research to determine the mediating pathways between motivational orientations, well-being, and academic performance. Such studies should also examine the role of other variables known to influence motivational orientations such as, self-confidence in one's ability (e.g., Zimmerman, 1995), or perceptions of autonomy and autonomy support (Vallerand et al., 1997). Additionally, future research should examine possible changes in these relationships since motivational orientations are known to alter as a result of both prior experiences and current situational factors (Ryan & Deci, 2000a & b). Given that in the present

study, motivation and key outcomes were measured in students' second year of study, individuals had had an extended period in which to develop perceived contingencies (or lack of) between their behaviors and outcomes. If, however, such measures had been taken in students first year at university, such contingencies may not have had time to develop, and relationships such as those in the present data, may not have been observed.

Finally, it should be noted that in the present study, both gender and entry qualifications accounted for a significant amount of the variance in academic performance scores. The finding that those individuals with higher entry qualifications achieved higher grades over the course of their university studies supports previous findings that secondary school performance and scores on college admission tests are the best predictors of academic performance at university (e.g., Allen, 1999). With regard to gender differences, previous studies have found that women were generally more motivated toward academic activities (Karsenti & Thibert, 1994), displayed a more self-determined motivational profile (Vallerand & Bissonnette, 1992; Vallerand et al., 1997), and tended to have higher levels of desire to finish university and persistence behavior than men (Allen, 1999), all of which may have a direct or indirect influence on academic performance. Consistent with this, women in the present sample had higher extrinsic motivation identified scores than did men, indicative of a more self-determined motivational profile, which may have had an indirect influence on academic performance. Currently, additional data is being collected from two cohorts of students giving data over a five-year time-span, which should enable a more detailed investigation of the direct and indirect relationships between motivational orientations, well-being, and academic performance, and gender differences in such relationships.

There are some potential limitations and qualifications concerning the results of this study, which need to be highlighted. First, nearly all of the measures were self-report which can be subjected to a number of criticisms, including the impact of response bias and the role of negative affectivity, particularly in the reporting of well-being and levels of stress (e.g., Watson & Clark, 1984). The performance part of the study is not subject to this criticism, as individuals' marks were obtained from departmental records. Second, while the performance part of the study was of a prospective design, the relationship between motivational orientations, adjustment, stress, and health while studying was cross-sectional, with motivations measured at the same time as the outcome variables. It is therefore not possible to ascertain the role of orientations in producing these outcomes. Although previous research indicates that at least in relation to behavioral consequences (e.g., persistence; Vallerand et al., 1997), motivational orientations play a causal role, the issue can only be resolved through a fully prospective longitudinal design. Third, the gender differences observed in relation to a number of key variables in this study should be interpreted with caution given the differences in sample size between men and women. While this difference reflects the gender imbalance of psychology courses in the United Kingdom, the impact of this difference on the regression models is unknown. Finally, the participant sample used in this study was selected from one British university, and included only psychology students. It could be argued that there may be different demands placed on students in different universities within the

United Kingdom, between UK universities and those in other countries, or between psychology and other academic disciplines, which may have had an impact on key outcome variables included here, as well as affecting the pattern of relations among the variables. Thus, caution should be exercised in generalizing the current findings beyond this student population.

NOTES

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