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Thomas Hamilton Bailey & Lisa J. Phillips

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The influence of motivation and adaptation on students' subjective well-being, meaning in life and academic performance

Thomas Hamilton Bailey and Lisa J. Phillips

Melbourne School of Psychological Sciences, University of Melbourne, Parkville, VIC, Australia

ABSTRACT

High rates of mental illness among students and discontinuation with university studies are regularly reported. The current study sought to explore relationships between motivation, university adaptation and indicators of mental health and well-being and academic performance of 184 first-year university students (73% female, mean age = 19.3 years). As expected, intrinsic motivation was associated with greater subjective well-being, meaning in life and academic performance. Extrinsic motivations showed few relationships to outcome variables, while amotivation was consistently associated with poor outcomes. Hierarchical regression revealed that after accounting for adjustment, motivational orientations provided a small, though significant, contribution to the prediction of outcomes. These results are discussed in relation to Self-Determination Theory, the eudaimonic/hedonic dichotomy and implications for career counselling and teaching.

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In 2011, 20% of Australians aged 15–64 years were enrolled in a course of study, with approximately 39% of these attending a tertiary education institution such as university (Australian Bureau of Statistics, 2011). Almost a quarter (23%) of Australian first-year students consider dropping out or leaving university altogether (James, Krause, & Jennings, 2010).

It has been widely acknowledged that the factors that influence student dropout are not fully understood (Coley & Coley, 2010; James et al., 2010; National Audit Office, 2007; Tinto, 2006). There is rarely one single reason why a student does not complete a course (Crosling, Heagney, & Thomas, 2009). Tinto (2006) has suggested that a broad 'array of forces, cultural, economic, social, and institutional shape student retention' (p. 3). These include: poor preparation for higher education; weak institutional and/or course match; unsatisfactory academic experience; lack of social integration; financial issues and personal circumstances (Jones, 2008).

Student motivation has been associated with student retention. Self-Determination Theory (SDT: Ryan & Deci, 2000) describes different types of motivation. Intrinsic

motivation is characterised by a desire to seek new challenges, to explore and learn (Ryan & Deci, 2000). Intrinsically motivated students use more effective learning strategies, prefer challenging tasks, enjoy their classes more and show sustained student involvement (Ames & Archer, 1988). Extrinsically motivated behaviours are performed for some consequence external to the task itself, such as acquiring rewards or avoiding punishment (Ryan & Deci, 2000), and are associated with greater levels of cheating (Davy, Kincaid, Smith, & Trawick, 2007), burnout (Pisarik, 2009) and higher dropout rates (Hardre & Reeve, 2003) among students. SDT also describes the state of amotivation – essentially being unmotivated – which has been positively associated with burnout (Pisarik, 2009) and plagiarism (Angell, 2006) by university students.

Baker (2004) examined the influence of motivational orientation on adaptation to university, stress, psychological ill-health and performance in second-year university students. Only intrinsic motivation predicted lower stress, while amotivation predicted greater stress, poorer adjustment to university and greater psychological illness and extrinsic motivation showed no relationships to any of these outcomes. In contrast, intrinsic and extrinsic motivation predicted higher and lower grades, respectively, in a study by Kaufman, Agars, and Lopez-Wagner (2008).

A study of disadvantaged South African students found that intrinsic motivation was positively correlated with adjustment to university and academic performance (Petersen, Louw, & Dumont, 2009). Moreover, students' adjustment predicted academic performance. In support of Baker's (2004) finding, intrinsic motivation was associated with lower stress, and also greater self-esteem. While amotivation was associated with lower academic performance, only extrinsic externally regulated motivation significantly predicted performance. The authors concluded that students motivated by external rewards such as high grades tended to perform poorly. In contrast, students who considered academic-related behaviours to be intrinsically valuable were better adjusted.

Measures of psychological health in these studies are restricted to indicators of pathology such as stress, anxiety, depression and social dysfunction. Other indicators such as subjective well-being (SWB) and meaning in life, stemming from the positive psychology literature, have not yet been investigated in conjunction with adaptation to university.

SWB, sometimes referred to as happiness, consists of three components: life satisfaction, the presence of positive mood and the absence of negative mood (Ryan & Deci, 2001). SWB taps into two distinct but overlapping philosophies (Kashdan, Biswas-Diener, & King, 2008; Ryan & Deci, 2001): hedonism (happiness and pleasure of both the mind and body [Kubovy, 1999]) and eudaimonism (well-being derived from engagement in activities that mesh with deeply held values and lead to feelings of fulfilment [Waterman, 1993]). Eudaimonism involves autonomy, environmental mastery, personal growth, self-acceptance, purpose in life and positive relations with others (Ryff & Singer, 2006).

Meaning in life is considered an important component of well-being (King, Hicks, Krull, & Del Gaiso, 2006). The *presence* of meaning in life has been described as coherence in one's life (Battista & Almond, 1973), goal directedness (Ryff & Singer, 2006) and the extent to which people see significance in their lives, accompanied by a sense of purpose that transcends mundane concerns of daily life (Steger, 2009). Considering life to have meaning is associated with a number of positive outcomes: higher optimism (Compton, Smith, Cornish, & Qualls, 1996; King et al., 2006), self-esteem (Steger,

Frazier, Oishi, & Kaler, 2006) and life satisfaction (Chamberlain & Zika, 1988) as well as lower levels of depression, anxiety (Steger et al., 2006) and suicidal ideation (Harlow, Newcomb, & Bentler, 1986). The *search* for meaning pertains to dynamic, active efforts to establish some comprehension of purpose and significance in life (Steger, Kashdan, Sullivan, & Lorentz, 2008). According to Frankl (1963), people who lack meaning in their lives suffer a deep sense of existential frustration, placing them at risk of mental illness (Steger et al., 2006). Interestingly, presence and search for meaning are relatively independent of one another (Steger et al., 2008), with young adults reporting higher levels of search for meaning and less presence of meaning than older adults (Steger, Oishi, & Kashdan, 2009).

The present study sought to determine whether student happiness, well-being and performance are explained by underlying motivations and adaptation to the university environment with a focus on first-year students. Based on previous literature, it was hypothesised that:

- (1) Higher intrinsic motivational orientation towards university would be associated with greater SWB and presence of meaning in life, lower levels of depression and anxiety, and higher academic performance. Extrinsic motivation was not expected to be significantly related to any of these outcomes, except academic performance because it reflects a controlled regulatory style where a value is not fully accepted as one's own. Amotivation would be associated with poor SWB, less presence of meaning in life, higher levels of depression and anxiety and lower academic performance.
- (2) Social adjustment, personal and emotional adjustment, academic adjustment and attachment to the university institution would each be associated with greater SWB, presence of meaning in life, lower levels of depression and anxiety and higher academic performance.
- (3) Motivational orientations would explain variation in SWB, presence of meaning in life, depression and anxiety and academic performance over and above adjustment to university.

Method

Participants

About 184 undergraduate first-year psychology students (49 males and 135 females) participated in this study in return for course credit. Participation was restricted to first-year university students to capture the experience of transition to university from secondary school. Participants were aged between 17 and 25 years, and it was unlikely that these students had any previous personal experience in the university environment. The mean age of participants was 19.3 years ($SD = 1.0$). The sample was 65.8% Australian born, and all participants spoke English as their primary language. The study received approval from the University of Melbourne Human Ethics Committee (project ID 1033893).

Measures

In addition to items relating to gender, age and birthplace, a number of established measures that have been extensively used in earlier related research and have demonstrated good psychometric properties were included in the questionnaire. Minor

adaptations to wording were required in a small number of items to ensure that the language suited the Australian participants.

The *Academic Motivation Scale* (AMS; Vallerand et al., 1992) is a 28-item self-report measure of student motivation to enrol in university based on SDT. Respondents rate how closely a list of reasons for studying at university reflects their own motivation on a 7-point Likert scale. The AMS has satisfactory internal consistency (mean $\alpha = .81$) and temporal stability over a one-month period (mean test-retest correlation = .79) (Vallerand et al., 1992).

As the AMS has not previously been utilised with Australian tertiary students, Exploratory Factor Analysis (EFA) was used to investigate the structure of the scale. A five-factor solution with clear item loadings that fit the data fairly well and resembled a parsimonious alternative to the seven-factor original scale was the result. These factors were labelled Intrinsic to Know and Toward Accomplishments (IM-Know: engagement in an activity to learn and accomplish); Intrinsic to Experience Stimulation (IM-Stim: engagement in an activity to experience pleasurable sensation); Extrinsic Identified and External Regulation (EM-Ext: behaviour is motivated through reward and constraint even if the behaviour is not fun); Extrinsic Introjected (EM-Int: behaviour motivated by pressure put on oneself to do something) and Amotivation (AM: the absence of intrinsic or extrinsic motivation). Factor scores were used throughout the subsequent analyses.

The 67-item *Student Adaptation to College Questionnaire* (SACQ; Baker & Siryk, 1989) is designed to capture four aspects of student adaptation to university: Academic Adjustment (Acad-Adj: the ability to manage the educational demands of university), Personal-Emotional Adjustment (PE-Adj: the level of psychological distress), Social Adjustment (Soc-Adj: the ability to deal with interpersonal experiences) and Institutional Attachment (Inst-Attach: the degree of commitment felt towards the university).

The SACQ has been extensively validated primarily with North American samples and demonstrates excellent concurrent validity with measures of loneliness, depressive symptoms and general adjustment, and with criterion-related measures such as social bonding, social activities, use of psychological services and use of study counselling (Beyers & Goossens, 2002; Napoli & Wortman, 1998). The predictive validity of the SACQ has also been demonstrated in studies of academic achievement (Germeijs & Verschueren, 2007) and attrition rates (Gerdes & Mallinckrodt, 1994).

EFA was performed to explore the structure of the SACQ in an Australian sample. A four-factor solution that matched the subscales originally described by Baker and Siryk (1989) was found. Factor scores were used throughout the subsequent analyses.

The anxiety (GHQ-Anx) and depression (GHQ-Dep) subscales of the *General Health Questionnaire* (GHQ; Goldberg & Williams, 1988) were included. The validity of the GHQ has been well established in numerous studies (e.g., Benjamin, Lennon, & Gardner, 1991; Goldberg & Williams, 1988), including research with Australian youths (Winefield, Goldney, Winefield, & Tiggemann, 1989). The Likert method of scoring (0–1–2–3) was chosen over the traditional method (0–0–1–1) because it produces wider variability in scores and facilitates the study of differences among low-prevalence groups with greater precision (Banks, 1983; Winefield et al., 1989). Higher scores on each subscale indicate greater psychological ill-health. GHQ-Anx and GHQ-Dep showed excellent reliability in the present study, $\lambda_2 = .87$ and $\lambda_2 = .90$, respectively.

The *Meaning in Life Questionnaire* (MLQ; Steger et al., 2006) was used to assess students' beliefs that their lives are significant and meaningful. The five-item *Presence of Meaning* (MLQ-Presence) subscale assesses cognitive appraisals of whether life is meaningful, while the five-item *Search for Meaning* (MLQ-Search) subscale assesses tendencies to actively seek meaning and purpose in life. Each item is rated on a 7-point Likert scale. The MLQ has demonstrated excellent convergent validity (Steger et al., 2006). Reliability of the MLQ in the present study was extremely high, $\lambda_2 = .87$ (Presence) and $\lambda_2 = .90$ (Search).

The *Satisfaction With Life Scale* (SWLS; Diener, Emmons, Larsen, & Griffin, 1985) consists of five brief statements rated on a 7-point Likert scale. Higher scores indicate more Satisfaction With Life (SWL). The SWLS is widely used and has demonstrated good convergent, discriminant and cross-cultural validity (Pavot & Diener, 1993). The SWLS showed excellent reliability in the present study, $\lambda_2 = .85$.

The *Positive And Negative Affect Schedule* (PANAS; Watson, Clark, & Tellegen, 1988) was used to assess affective components of SWB. Respondents indicate the extent they have recently experienced 10 positive and 10 negative emotions on a 5-point Likert scale. The PANAS has high reliability and validity (Crawford & Henry, 2004), and reasonable stability ($r = .47$) over a two-month time period (Watson et al., 1988). In the present study, reliability of the positive affect (PA) and negative affect (NA) subscales was $\lambda_2 = .87$ and $\lambda_2 = .85$, respectively.

All participants volunteered their final marks from each subject completed in their first semester, which were then averaged for each individual as an objective measure of academic achievement. Self-reported marks have shown a correlation of .96 with actual marks (Salmela-Aro & Tynkkynen, 2010).

Results

Data were first screened for missing scores. One participant failed to respond to one item of the GHQ, and two participants provided single responses that were outside the response range (one on the AMS and one on the PANAS). These three scores were replaced with the participant's mean item score on that measure. Two optional SACQ items referring to living away from home were answered inconsistently (83 answered item 26, and 61 answered item 33) so were removed from any analysis. One case was an outlier on the Attachment subscale of the SACQ and was thus removed from all analyses, leaving 183 participants.

Descriptive statistics

Descriptive statistics are given in [Table 1](#). (Descriptive statistics were not obtained for the SACQ and AMS as factor scores were used in the analyses.)

Hypothesis 1

As anticipated, intrinsic motivation was positively associated with PA and presence of meaning ([Table 2](#)). Intrinsic Motivation to Know and Accomplish was positively associated with grade, while Intrinsic Motivation for Stimulation was positively associated with

Table 1. Descriptive statistics.

	Mean		Std. deviation	Skewness		Kurtosis	
	Statistic	Std. error		Statistic	Std. error	Statistic	Std. error
PA	33.19	0.50	6.81	-0.17	0.18	-0.42	0.36
NA	20.07	0.52	7.04	0.82	0.18	0.58	0.36
SWLS	24.45	0.44	6.01	-0.74	0.18	0.16	0.36
MLS-Presence	17.14	0.33	4.40	-0.38	0.18	0.97	0.36
MLS-Search	25.54	0.48	6.44	-0.30	0.18	-0.22	0.36
GHQ-Anx	13.03	0.32	4.39	0.74	0.18	0.12	0.36
GHQ-Dep	9.49	0.28	3.84	2.46	0.18	6.87	0.36
Grade	72.37	0.49	6.68	-0.32	0.18	1.28	0.36

Notes: Skew and kurtosis shown in bold indicates a non-normal distribution. PA, PANAS Positive Affect; NA, PANAS Negative Affect; GHQ-Dep, GHQ-Depression; GHQ-Anx, GHQ-Anxiety; MLQ-Presence, Meaning in Life Scale-Presence; MLS-Search, Meaning in Life Scale-Search; SWLS, Satisfaction with Life Scale and Grade, Academic mark.

Search for Meaning. Intrinsic motivational orientations were unrelated to Anxiety and Depression. Few significant correlations were found between extrinsic motivation and the measures of well-being, the exceptions being positive associations with both Search and Presence of Meaning. Contrary to expectations, extrinsic motivation was not significantly associated with academic outcome.

Amotivation showed significant negative correlations with PA, SWL, Presence of Meaning, and Grade and positive correlations with NA, Depression and Anxiety.

Hypothesis 2

Social Adjustment was positively associated with PA and SWL, and negatively associated with Search for Meaning, NA, Anxiety and Depression (all significant correlations). Personal-Emotional Adjustment, Institutional Attachment and Academic Adjustment showed the same pattern of relationships, although these relationships were weaker for the latter. Only Academic Adjustment was positively correlated with Grade.

Hypothesis 3

Hierarchical regression was used to test the hypothesis that motivational orientations would predict SWB, psychological health and performance over and above adaptation to university.

Variables were first transformed using categorical regression ('CATREG' in SPSS). CATREG offers a procedure known as 'discretisation' which can correct non-normally distributed variables (IBM, 2014). This was applied to five variables that showed severe skew and kurtosis (GHQ-Dep, Inst-Attach, AM, EM-Ext and average grade). Regression coefficients can be calculated regardless of the normality of variables; however, normally distributed residuals are needed for accurate estimation of statistical tests of fit (UCLA, 2007).

Categorical regression does not assume linear relationships between predictors and dependent variables, an assumption that was considered overly restrictive. A better fitting nonlinear regression curve may be found by insisting only that variable 'categories' be ordered. CATREG uses 'optimal scaling' (cf. Young, 1981) to quantify and transform categorical variables to produce an optimal regression equation (IBM, 2014). A

Table 2. Zero-order correlations (Pearson's *r*).

	NA	GHQ-Anx	GHQ-Dep	SWLS	MLQ-Presence	MLQ-Search	IM-Know	IM-Stim	EM-Int	EM-Ext	AM	Soc-Adj	PE-Adj	Acad-Adj	Inst-Attach	Grade
PA	-.40**	-.42**	-.41**	.53**	.23**	-.11	.22**	.16*	.15*	.05	-.37**	.39**	.50**	.25**	.37**	-.05
NA		.63**	.63**	-.43**	-.15*	.34**	-.10	-.03	.12	.08	.41**	-.29**	-.70**	-.28**	-.34**	-.10
GHQ-Anx			.18**	-.35**	-.05	.37**	-.09	.07	.16*	.05	.36**	-.16*	-.81**	-.16*	-.25**	-.01
GHQ-Dep				-.53**	-.10	.38**	-.12	.07	.04	.06	.44**	-.29**	-.59**	-.04	-.44**	-.19*
SWLS					.25**	-.33**	.21**	.04	-.05	-.02	-.40**	.48**	.38**	.19*	.41**	.06
MLQ-						.15*	.21**	.25**	.16*	.23**	-.25**	.12	.05	.11	.08	-.04
Presence							.13	.18*	.32**	.19*	.29**	-.19**	-.40**	-.09	-.23**	-.05
MLQ-Search								.43**	.28**	.16*	-.27**	.13	.11	.18*	.35**	-.23**
IM-Know									.24**	.02	-.17*	.04	-.01	.17*	.16*	.08
IM-Stim										.35**	-.01	.00	-.18*	.01	.06	.04
EM-Int											-.10	.02	-.08	-.09	.13	-.09
EM-Ext												-.30**	-.41**	-.18*	-.60**	-.21**
AM													.20**	.06	.29**	.04
Soc-Adj														.20**	.34**	.06
PE-Adj														.20**	.15	.28**
Acad-Adj														.20**	.15	.28**
Inst-Attach														.20**	.15	.28**

Notes: PA, PANAS Positive Affect; NA, PANAS Negative Affect; GHQ-Anx, GHQ-Anxiety; GHQ-Dep, GHQ-Depression; MLQ-Presence, Meaning in Life Scale-Presence; MLQ-Search, Meaning in Life Scale-Search; SWLS, Satisfaction with Life Scale; AMS subscales: IM-Know, Intrinsic Motivation to Know and Accomplish; IM-Stim, Intrinsic Motivation for Stimulation; EM-Int.; Extrinsic Motivation-Introjected Regulation; EM-Ext, Extrinsic Motivation-External Regulation; AM, Amotivation; SACQ subscales: Soc-Adj, Social Adjustment; PE-Adj, Personal-Emotional Adjustment; Acad-Adj, Academic Adjustment; Inst-Attach, Institutional Attachment and Grade, Academic mark.

*Correlation is significant at the 0.05 level (two-tailed).

**Correlation is significant at the 0.01 level (two-tailed).

Table 3. Hierarchical categorical regression analysis predicting SWL.

Predictor	β	T	R	R^2	R^2_{adj}	SE	ΔR^2	ΔF
Block 1			.63	.39	.38	.79	.39	28.53**
Soc-Adj	.39	6.34**						
PE-Adj	.26	4.25**						
Acad-Adj	.12	2.10*						
Inst-Attach	.21	3.26**						
Block 2			.65	.42	.40	.78	.03	3.98*
IM-Know	.10	1.61						
AM	-.14	-2.22*						

Notes: IM-Know, Intrinsic Motivation to Know and Accomplish; AM, Amotivation; Soc-Adj, Social Adjustment; PE-Adj, Personal-Emotional Adjustment; Acad-Adj, Academic Adjustment; Inst-Attach, Institutional Attachment; β , standardised beta; SE, standard error of the estimate and R^2_{adj} , adjusted R^2 .

*Significant at 0.05 level (two-tailed).

**Significant at 0.01 level (two-tailed).

spline-ordinal transformation was used to identify smooth, systematic relationships between variables.

In the following regressions, only variables that showed a significant zero-order correlation with dependent variables were included as predictors.

All four SACQ factors were significant positive predictors of SWL and explained 39% of the variance in SWLS scores (Table 3). Amotivation was a significant negative predictor of SWLS, and the only motivational orientation that predicted SWLS over and above Adaptation (explaining an additional 3% of variance).

All four SACQ factors were significant predictors of PA and explained 46% of the variance in PA scores (Table 4). Extrinsic motivation that is internally regulated (EM-Int) significantly predicted PA, and intrinsic motivation to know and accomplish (IM-Know) was marginally significant as a positive predictor of PA. These two AMS factors explained 7% of variance in PA scores over and above the SACQ factors.

Social Adjustment, Academic Adjustment and Personal-Emotional Adjustment were significant negative predictors of NA, explaining 56% of the variance in NA scores (Table 5). Amotivation was a positive predictor of NA, explaining an additional 1% of variance in NA scores.

Table 4. Hierarchical categorical regression analysis predicting positive affect.

Predictor	β	T	R	R^2	R^2_{adj}	SE	ΔR^2	ΔF
Block 1			.68	.46	.44	.75	.46	37.16**
Soc-Adj	.32	5.58**						
PE-Adj	.42	7.39**						
Acad-Adj	.22	3.99**						
Inst-Attach	.15	2.69**						
Block 2			.73	.53	.51	.70	.07	6.70**
IM-Know	.09	1.68						
IM-Stim	.08	1.52						
EM-Int	.21	3.99**						
AM	-.07	-1.32						

Notes: IM-Know, Intrinsic Motivation to Know and Accomplish; IM-Stim, Intrinsic Motivation for Stimulation; EM-Int, Extrinsic Motivation-Introjected Regulation; AM, Amotivation; Soc-Adj, Social Adjustment; PE-Adj, Personal-Emotional Adjustment; Acad-Adj, Academic Adjustment; Inst-Attach, Institutional Attachment; β , standardised beta; SE, standard error of the estimate and R^2_{adj} , adjusted R^2 .

*Significant at 0.05 level (two-tailed).

**Significant at 0.01 level (two-tailed).

Table 5. Hierarchical categorical regression analysis predicting negative affect.

	Predictor	β	T	R	R^2	R^2_{adj}	SE	ΔR^2	ΔF
Block 1				.75	.56	.55	.68	.56	55.61**
	Soc-Adj	-.14	-2.64**						
	PE-Adj	-.62	-11.66**						
	Acad-Adj	-.20	-4.05**						
	Inst-Attach	-.08	-1.57						
Block 2				.75	.57	.56	.67	.01	5.09*
	AM	.14	2.26*						

Notes: AM, Amotivation; Soc-Adj, Social Adjustment; PE-Adj, Personal-Emotional Adjustment; Acad-Adj, Academic Adjustment; Inst-Attach, Institutional Attachment; β , standardised beta; SE, standard error of the estimate and R^2_{adj} , adjusted R^2 .
 *Significant at 0.05 level (two-tailed).
 **Significant at 0.01 level (two-tailed).

Table 6. Hierarchical categorical regression analysis predicting presence of meaning in life.

	Predictor	B	T	R	R^2	R^2_{adj}	SE	ΔR^2	ΔF
Block 1				.34	.11	.09	.95	.11	5.75**
	Soc-Adj	.16	2.17*						
	PE-Adj	.19	2.58*						
	Acad-Adj	.17	2.31*						
	Inst-Attach	.04	0.56						
Block 2				.57	.33	.30	.84	.21	13.86**
	IM-Know	.16	2.58*						
	IM-Stim	.15	2.30*						
	EM-Ext	.24	3.76**						
	AM	-.36	-4.51**						

Notes: Soc-Adj, Social Adjustment; PE-Adj, Personal-Emotional Adjustment; Acad-Adj, Academic Adjustment; Inst-Attach, Institutional Attachment; IM-Know, Intrinsic Motivation to Know and Accomplish; IM-Stim, Intrinsic Motivation for Stimulation; EM-Ext, Extrinsic Motivation-External Regulation; AM, Amotivation; B , standardised beta; SE, standard error of the estimate; R^2_{adj} , adjusted R^2 .
 *Significant at 0.05 level (two-tailed).
 **Significant at 0.01 level (two-tailed).

Table 6 indicates that Social, Personal-Emotional and Academic Adjustment were significant positive predictors of Presence of Meaning In Life, explaining 11% of variance in MLQ-Presence scores. Four of the five motivational orientations were significant positive predictors of MLQ-Presence, and Amotivation was a significant negative predictor, all explaining 21% of variance in MLQ-Presence scores over and above SACQ factor scores.

Academic Adjustment was the only SACQ factor to significantly predict academic grade, explaining 13% of the variance (Table 7). Intrinsic motivation to know and accomplish was the only motivational orientation that explained a significant amount of variation in average grade.

Table 7. Hierarchical categorical regression analysis predicting academic grade.

	Predictor	β	T	R	R^2	R^2_{adj}	SE	ΔR^2	ΔF
Block 1				.35	.13	.12	.94	.13	26.00**
	Acad- Adj	.35	5.10**						
Block 2				.41	.17	.15	.92	.04	4.47*
	IM-Know	.17	2.43**						
	AM	-.09	-1.24						

Notes: IM-Know, Intrinsic Motivation to Know and Accomplish; AM, Amotivation; β , standardised beta; SE, standard error of the estimate and R^2_{adj} , adjusted R^2 .
 *Significant at 0.05 level (two-tailed).
 **Significant at 0.01 level (two-tailed).

Similar hierarchical categorical regressions were carried out for the two GHQ subscales. Motivational orientations did not explain a significant amount of variance in GHQ-Anx over and above the SACQ factor scores ($F_{\text{change}}(2, 176) = 1.26, p > .05$). Amotivation was the only motivational orientation that was a significant positive predictor of depression, explaining 2% of the variance in GHQ-Dep over and above the SACQ factors ($F_{\text{change}}(1, 178) = 5.41, p < .05$).

Discussion

This study sought to determine the extent to which motivational orientation and adaptation to university explains student mental health, academic performance and well-being. Understanding the factors that enable students to thrive may help to reduce the rates of academic discontinuation.

Overall, Hypothesis 1 was supported. Students who were intrinsically motivated to gain knowledge and to accomplish tasks at university tended to report more SWL, more PA, less NA, more presence of meaning in life and higher grades. Extrinsic motivations showed few significant relationships to these outcomes, and contrary to the hypothesis, were not associated with higher grades. Furthermore, amotivation was significantly associated with both anxiety and depression in a negative direction.

Hypothesis 2 was also supported: students who reported better adjustment in their first six months of university also reported greater SWB, perceived life to be more meaningful, experienced less psychological symptoms and achieved higher grades.

Hypothesis 3 represented a synthesis of the first two hypotheses, and predicted that students' motivational orientations would account for variation in SWB, presence of meaning in life, mental health and academic performance over and above their adaptation to university. This hypothesis was largely supported.

Outcomes associated with motivational orientations

This study provides strong support for the SDT of motivation (Ryan & Deci, 2000): students who were motivated to study by their curiosity to explore and learn new concepts, and those who found pleasure in the process of creating and achieving tended to feel a stronger sense of well-being, higher life satisfaction and meaning, and also performed better academically. In contrast, extrinsic motivations showed few relationships to any of the outcomes measured. According to SDT, extrinsic motivation is less reliably linked to persistence, performance and psychological health, and the present study suggests that extrinsic motivation towards university study is not significantly associated with SWB.

One form of extrinsic motivation did show a concerning pattern of relationships with well-being outcomes. Students who expressed a high degree of introjected regulation are thought to depend on their success and achievements to maintain their self-esteem, ego and sense of pride. Failures carry threats of guilt, shame and self-derogation. In the current study, students who expressed this form of motivation reported higher PA but also increased anxiety. Other studies have found introjection to be associated with worry (Ryan & Connell, 1989). Possibly, these students feel pressured to adopt a positive attitude and feel an accompanying level of anxiety in maintaining this position.

Previous studies have suggested that amotivation is associated with greater stress and poor adjustment (Baker, 2004), reduced self-esteem and poorer academic performance (Petersen et al., 2009). In the current sample, amotivation was associated with lower levels of meaning in life and higher levels of anxiety and depression. Amotivated students had not adjusted to university well nor were they performing well. Students with these characteristics have been found to be at higher risk of discontinuing university study (Gerdes & Mallinckrodt, 1994; James et al., 2010). Thus, a young person's lack of motivation at university appears to have overtures to their overall mental health.

Academic performance

Academic adjustment and intrinsic motivation to gain knowledge and to accomplish tasks were the *only* significant predictors of performance, explaining 13% and 4% of variance, respectively. Although this suggests that students benefit from engaging in behaviours that are intrinsically valuable and interesting, it is important to acknowledge that this advantage was relatively small.

Findings from the current study are both supported and unsupported by previous research. Among first-year students in South Africa, only externally regulated extrinsic motivation predicted a small amount of variance in academic performance (Petersen et al., 2009). In a sample of second-year students in the UK, none of the motivational orientations predicted subsequent academic performance (Baker, 2004), though a study stretching three years showed intrinsic motivation towards accomplishments accounted for 5% of variance in students' overall performance (Baker, 2003). In a sample of first-year students in the USA, both intrinsic and extrinsic motivation positively predicted academic performance (Conti, 2000). These inconsistencies may reflect differences in how academic performance is measured depending on the university, the course or area of study.

Amotivation

The current findings suggest that students who lacked motivation were struggling to meet the social and emotional challenges of university. While some researchers have proposed that amotivation may be responsible for poor mental health in students (Baker, 2004), the present study suggests that an equally valid explanation for poor mental health may be unsuccessful integration and adjustment to the social and emotional aspects of attending university. In contrast to Hypothesis 3, motivational orientations provided almost no additional insight into students' mental health, SWB or performance once adjustment had been accounted for. The results also contradict previous research reporting that amotivation predicts greater stress, low self-esteem and poor mental health among university students (Baker, 2003, 2004; Petersen et al., 2009).

Implications for students and educators

Students who study at university because they are curious and interested to explore novel and challenging tasks tend to feel an accompanying sense of meaning in their lives. A strong sense of meaning in life has been associated with other beneficial outcomes such as better work adjustment (Bonebright, Clay, & Ankenmann, 2000), more certainty and

comfort with career choice (Duffy & Sedlacek, 2007) and greater physical health (Ryff & Singer, 2008). This suggests that enrolling in courses or subjects that are of innate interest and that hold some challenge for the student should be emphasised when providing course selection advice.

The onus for developing strategies to maximise student retention does not lie solely with students (Tinto, 2006). Wimpenny and Savin-Baden (2013) noted that the teaching style and approachability of an academic is important, emphasising ‘genuineness and empathic understanding to student learning, acknowledging students’ struggles, and insecurities, pleasures and pains’ (p. 324). Zepke and Leach (2010) suggested that learning environments that are active, collaborative and foster learning relationships as well as challenging and enriching educational experiences for students that extend their academic abilities lead to enhanced student engagement and motivation – and therefore may reduce dropout and poor mental health outcomes. Problem-based learning may fulfil some of these criteria (Rotgans & Schmidt, 2012).

Limitations

The cross-sectional design of the current study did not allow investigation of causal relationships between motivational orientations and outcomes. A longitudinal design would elucidate the trajectories of students’ motivations, well-being, health and performance over time. This study relied exclusively on self-report measures and is therefore subject to reporting bias and common method variance bias (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003), which may have led to inflated scores on socially desirable outcomes, such as PA. However, self-report is a long-standing, valuable and valid measurement strategy in the behavioural sciences (Howard, 1994).

Future research

The number of participants in this study who later withdrew from their studies was not obtained and is an obvious aspect to be included in future research. Previous research has indicated that ‘mature-age students’ returning to study later in life report a stronger sense of clarity and purpose with respect to their tertiary studies, and demonstrate much lower discontinuation rates (James et al., 2010). Investigation of motivation, SWB and academic performance of mature-age students and comparison with younger students may highlight areas for intervention to increase retention rates of younger students. Finally, the factors associated with student retention in online courses are only starting to be understood (Cochran, Campbell, Baker, & Leeds, 2013; Willging & Johnson, 2009). Replication of this study with students enrolled in online courses is recommended.

Summary and conclusion

This study sought to determine whether first-year students’ well-being, meaning in life and performance could be explained by their motivational orientations and psychosocial adjustment. Both intrinsic motivation and successful adaptation to university were positively associated with global SWB, presence of meaning in life and psychological health. Amotivation demonstrated the reverse pattern of relationships. Contrary to expectations,

motivation was only able to explain a significant amount of variability in meaning and performance once level of adaptation during their first six months at university was accounted for. This finding highlights the importance of first-year students' social, emotional and academic adjustment to university for their happiness and mental health. Finally, these findings reveal that meaning in life is closely linked to self-determined forms of motivation, which has implications for students considering their study options.

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