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## Ups and downs in mood and energy: Associations with academic outcomes in higher education

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### Abstract\*

*Individual differences in mood and energy may affect academic outcomes in higher education. With little previous research investigating this relationship it is not known whether mood and energy traits help or hinder academic performance. The current study addresses this gap in the literature by investigating ups (high mood and energy) and downs (low mood and energy) in a small sample of University students in their first year of a psychology degree. The results suggest that low mood and energy traits may be detrimental to academic performance. High mood and energy traits however, were not associated with academic performance. Implications of the findings, in particular those regarding low mood and energy, are that, unlike the trait itself, the behaviours associated with the trait (e.g., procrastination, distraction, low motivation) are amenable to change through psychological interventions. Several of these interventions are discussed.*

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## Academic Engagement

Ups and downs in mood and energy may help explain fluctuating levels of academic engagement amongst University students. Higher levels of mood and energy can be associated with increased vigour and confidence, and thus enhanced engagement with academic tasks. However, increased mood and energy may also be associated with higher levels of distractibility and extra-curricular sociability, behaviours that are detrimental to academic engagement and performance. Lower levels of mood and energy also may have detrimental effects on engagement and performance due to lack of motivation and procrastinatory behaviours. The current study aims to investigate academic outcomes associated with these mood and energy traits as it is an unresolved question whether such traits help or hinder students in an academic context, and to what extent they do so.

Several psychological traits have been shown to predict academic performance in higher education. The most consistent findings appear to support individual difference factors such as Conscientiousness (McAbee & Oswald, 2013) and Self-efficacy (Richardson, Abraham, & Bond, 2012) in enhancing academic performance, and Neuroticism (Chamorro-Premuzic & Furnham, 2003) and Procrastination (Steel, 2007; Tice & Baumeister, 1997) in diminishing performance. Relatively little investigation has been conducted into how mood and energy traits are related to academic performance. What little research that has been done in this area has focused on the impact of depression on academic performance. Depression is strongly characterised by low mood and energy, so this literature may inform relationships between academic performance and these low mood and energy traits.

Andrews and Wilding (2004) investigated the association between depression and academic outcomes in a large sample of UK undergraduates. Depression was measured on

the Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983) with 16% of the sample reporting depressive symptoms. Depressive onset was found to be associated with significantly lowered exam performance, outweighing other factors such as anxiety and adverse life experiences in predicting lower exam scores. Of the participants who reported depressive symptoms in this study, approximately 75% were at the mild end of the depressive spectrum (“possible” cases of depression on the HADS), thus showing that even mild levels of depression are negatively associated with academic outcomes. While exam performance is a relatively unsophisticated indicator of academic outcomes, this study nevertheless provides evidence of lowered mood and energy being associated with academic performance.

Eisenberg, Golberstein, and Hunt (2009) examined the association between several mental health conditions and how they affect academic performance in a large sample of American undergraduate students. The students completed several mental health screening instruments online and via self-report. After controlling for gender, age, and previous academic performance, depression was found to be the strongest predictor of reduced grade point average (GPA). The mechanism through which depression affected GPA was not specifically explored in this study, although the authors suggested it may be due to reduced productivity during study time rather than the total amount of time spent studying per se. The instrument used to measure depression in this study was the Patient Health Questionnaire-9 (PHQ-9; Spitzer, Kroenke, & Williams, 1999), a screening measure of depressive symptoms based on DSM-IV diagnostic criteria for Major Depressive Disorder. Like Andrews and Wilding (2004), Eisenberg et al. confirmed that depression negatively affected academic performance.

Richardson et al. (2012) conducted a systematic review and meta-analysis of over 7,000 studies

and 241 data sets investigating the psychological antecedents of University students' grades. Among many other variables they measured depression, defining it as "low mood, pessimism, and apathy experienced over an extended length of time" (p. 358), thus capturing the trait form of depression and its associated low mood and energy features. In contrast to the previous studies mentioned, they found that depression did not significantly predict GPA. They did however, find that effort regulation, defined as "persistence and effort when faced with challenging academic situations" (p. 357) was moderately associated with a higher GPA. Effort regulation, as defined for the purposes of their meta-analysis, would appear to share several features with the high mood and energy traits being investigated in the current study. While other variables explained more (e.g., academic self-efficacy, previous academic performance) or similar (e.g., grade expectations) amounts of variance in GPA than effort regulation, the review showed that this individual difference factor explained more variance in academic performance than other factors, such as Conscientiousness, Neuroticism (negatively), Procrastination (negatively), and Social Support, that have previously been shown to be important predictors of academic success.

The previously cited research presents mixed evidence of the impact mood and energy traits can have on academic performance. This may be partly due to the variety of ways in which these traits have been identified and measured. In the current study, a model of mood and energy traits based on the clinical mood disorder of Bipolar Disorder (BD) was used because the traits that are thought to underpin vulnerability to BD – hypomania and depression – are strongly characterised by variations in mood and energy (higher and lower, respectively). The 7 Up 7 Down instrument (Youngstrom, Murray, Johnson, & Findling, 2013) would appear to be the ideal candidate measure for identifying individual differences in these mood and energy traits. It was developed specifically

for the purpose of measuring *up* (hypomania) and *down* (depression) traits in normal populations. The instrument contains seven items designed to measure the *up* trait and seven items designed to measure the *down* trait. The items address key mood (e.g., "extreme happiness", "sadness", "hopelessness") and energy ("intense energy", "excitement", "down in the dumps") characteristics associated with each trait. Another advantage of using the 7 Up 7 Down instrument to investigate mood and energy traits is that it separates the *up* and *down* traits so that they can be measured independently.

Using the 7 Up 7 Down instrument to measure the separate *up* and *down* traits of mood and energy, the current study aimed to investigate whether these traits were associated with academic outcomes. The academic outcome measures used were students' total scores for the unit of study across all assessment pieces, and students' level of engagement with the teaching and learning activities of the unit. The latter outcome measure was used in recognition of the fact that many factors influence students' scores on assessments, including some that are out of their control (e.g., variations in marking standards between markers). Engagement on the other hand, is an outcome measure that is more effectively under the control of the student – they choose whether to attend lectures and tutorials, and whether they complete non-compulsory learning activities. Operationalisation of the Engagement variable is discussed in further detail in the Measures section.

Strong predictions regarding the relationships between mood and energy traits and academic outcomes are not possible. Based on theory alone, it can be predicted that the *down* trait (depression; low mood and energy) would be associated with poorer academic outcomes (lower levels of engagement and a lower unit score), yet data from previous studies do not consistently support such a prediction. We are also unable to make a strong prediction

regarding the relationship between the *up* trait (hypomania; high mood and energy) and academic outcomes. This relationship could be either positive or negative, with higher mood and energy being potentially associated with behaviours that both increase (vigour, persistence) and decrease (distractibility, extra-curricular sociability) academic performance. The research questions being investigated in the current study will contribute to our understanding of the ways in which psychological constructs contribute to academic outcomes.

## Method

### Participants

Participants at the baseline stage of the study were 72 students (68% female) with a mean age of 23.04 years ( $SD = 8.33$ ) studying psychology at a university in Melbourne, Australia. The students were volunteers recruited through a first-year research experience program. They were not paid for participation at the baseline stage of the study, however students were asked to indicate whether they were interested in completing the follow-up stage of the study, for which they would be paid \$30. Twenty-four participants (67% female; mean age 24.79 years,  $SD = 11.33$  years) agreed to participate in the follow-up stage of the study.

### Measures

Participants completed the 7 Up 7 Down Inventory at the baseline stage of the study using an online questionnaire:

7 Up 7 Down Inventory (Youngstrom et al., 2013).

The 7 Up 7 Down Inventory is a 14-item measure of the separable trait dimensions of hypomanic and depressive tendencies. A 4-point scale ranging from “Never or Hardly Ever” to “Very Often or Almost Constantly” is used with possible scores on each scale ranging from

0-21. Example items include: “Have you had periods of extreme happiness and high energy lasting several days or more when what you saw, heard, smelled, tasted, or touched seemed vivid or intense?” (Hypomania) and “Have there been long periods in your life when you felt sad, depressed, or irritable most of the time?” (Depression). Early testing of the instrument has shown that the hypomanic and depressive dimensions are moderately correlated (as intended by the authors) and have good to excellent psychometric properties.

Also at the baseline stage of the study, participants completed the following measures of traits that have previously been associated with academic performance:

Academic Motivation Scale (AMS; Vallerand et al., 1992)

The AMS measures participants’ self-reported reasons for attending University. There are 28 items, each measured on a 7-point likert-type scale, ranging from “Does not correspond at all” to “Corresponds exactly”. Three elements of academic motivation are assessed on the scale – Intrinsic motivation (example item: “I go to University because I experience pleasure and satisfaction while learning new things”), Extrinsic motivation (example item: “I go to University because I think that a University education will help me better prepare for the career I have chosen”), and Amotivation (example item: “I can’t see why I go to college and frankly, I couldn’t care less”). The overall scale and the subscales have each demonstrated good to excellent psychometric properties.

International Personality Item Pool (IPIP; Goldberg, 1992)

The IPIP measures the personality dimensions of the Five-Factor model of personality. The current study will only use items measuring the Conscientiousness factor. The 20 items from Conscientiousness scale are rated on a 5-point scale ranging from “very inaccurate” to “very

accurate". Example items include: "[I] am always prepared" and "[I] make plans and stick to them". The psychometric properties of this scale are strong (see, [www.ipip.ori.org](http://www.ipip.ori.org)).

Work Engagement Scale – Student (WES; Schaufeli, Martínez, Pinto, Salanova, & Barker, 2002)

The WES-S measures student engagement on a 24-item scale across three subscales – Vigour (example item: "When I'm studying I feel mentally strong"), Dedication (example item: "I find my studies to be full of meaning and purpose"), and Absorption (example item: "Time flies when I'm studying"). Items are scored on a 7-point frequency rating scale ranging from "Never" to "Always". This scale and its subscales have also demonstrated good to excellent psychometric properties.

Students also reported their academic-related strengths and weaknesses. They were asked to describe these strengths and weaknesses in their own words in a written open-response format.

At the follow-up stage, participants indicated on an online survey how many lectures (maximum of 12) and tutorials (maximum of 12) they had attended throughout the semester of teaching. They also reported how many non-compulsory online tests they had completed (maximum of 10).<sup>1</sup> A composite measure of Engagement with the learning and teaching activities of the unit of study was defined as the sum of these three variables. Also at the follow-up stage, participants' final overall percentage score for the unit (Unit Score) was recorded.

**Table 1**

***Means and Standard Deviations for Predictor and Outcome Variables in Both Baseline (n = 72) and Follow-up (n = 24) Samples***

	Baseline		Follow-up	
	M	SD	M	SD
7 Up 7 Down				
Up-Hypomania	4.89	3.81	4.08	3.26
Down-Depression	6.68	5.65	7.58	5.91
IPIP				
Conscientiousness	36.26	5.09	37.07	5.51
AMS				
Intrinsic motivation	40.58	10.40	43.25	10.09
Extrinsic motivation	44.41	9.51	45.54	8.39
Amotivation	5.76	2.93	5.25	2.61
WES				
Vigour	21.39	8.04	22.79	8.61
Dedication	20.10	6.29	21.54	6.33
Absorption	17.92	9.11	19.96	9.28
Unit Outcomes				
Engagement	-	-	24.38	7.63
Unit Score	-	-	76.13	10.09

*Note.* IPIP = International Personality Item Pool, AMS = Academic Motivation Scale, WES = Work Engagement Scale - Student version.

<sup>1</sup> The online tests related to the content of the lectures and tutorials and were posted weekly. There was no extrinsic reward (such as bonus marks) for completing the quizzes. Students were however, encouraged to complete them on a weekly basis in order to test their understanding of the learning materials.

## Procedure

Students completed the baseline questionnaire online, and at a time and location that was convenient to them. At the end of the semester of teaching, students who had indicated an interest in participating in the follow-up stage of the study were contacted by email. They were sent a link to the follow-up survey and, once the survey was completed, were paid for their participation.

## Results

Table 1 presents descriptive statistics for the sample at baseline and follow-up.

Minor differences in mean scores between the sample at baseline and the sample at follow-up can be seen in Table 1. Statistical tests of the differences between those who participated in the follow-up stage ( $n = 24$ ) and those who did not ( $n = 48$ ) showed no significant differences in any of the measured variables.

Correlations between all variables were investigated for interrelationships with the Up-Hypomania and Down-Depression scales. The two outcome variables – Engagement and Unit Score – were also included in the correlation matrix (Table 2). For this reason, only data from those who volunteered to participate in the follow-up stage, and who therefore consented to their final results being accessed for the purposes of this study, are included in the correlation matrix.

Down-Depression showed moderate negative correlations with several variables. Higher levels of this trait were associated with lower levels of Intrinsic motivation, Vigour, and a lower Unit Score. Down-Depression was also negatively correlated with the measure of Engagement; thus, higher levels of this trait were associated with lower levels of Engagement with the unit. Up-Hypomania was not related to any of the academic-related variables.

Other relationships of interest in Table 2 include a moderate, positive correlation between Engagement and Unit Score. This suggests that the negative relationship between Down-Depression and Unit Score may be mediated by the level of Engagement with the unit. A mediation model testing the indirect relationship between these variables however, was not significant,  $r = -.23$ , 95% CI  $[-.89, .05]$ . It was also interesting to note that Conscientiousness did not correlate strongly with either Engagement or Unit Score. Conscientiousness, alongside cognitive ability, is one of the most commonly reported individual difference factors for predicting academic success (e.g., McAbee & Oswald, 2013), however this relationship did not emerge in the current study.

To further understand the relationship between Down-Depression and both Engagement and Unit Score, it is instructive to investigate the self-reported strengths and weaknesses of students scoring highly on the depressive trait (Down-Depression score  $\geq 10$ ). The self-reported weaknesses in particular refer to such unhelpful behaviours as “perfectionism”, “procrastination”, “distraction”, and “[lack of] motivation”. One student in particular (Female, 17 years old) stated:

I'm not motivated to go to classes and tutorials despite actually being interested in them, sometimes even when I'm on campus. I also don't prepare for exams very well because I don't cope well with stress, I just procrastinate and then have a crisis every night the week before because I know I should be studying but I physically can't.

The self-reported strengths of students with high Down-Depression scores were less consistent, but behaviours commonly referred to included: “organisation”, “time management” and, somewhat unexpectedly, persistence (e.g., “push through ... to get the job done”, “not giving up when I find an assignment hard”). Organisation and time management may be

**Table 2**  
**Correlations between Predictor and Outcome Variables in the Follow-up Sample (n = 24)**

	2	3	4	5	6	7	8	9	10	11
1. Up-Hypomania	.10	-.23	.07	.28	-.05	.04	-.02	.25	-.04	-.04
2. Down-Depression	-	-.26	-.40	.26	.17	-.40	-.22	-.10	-.34	-.42
3. Conscientiousness		-	.12	-.11	-.46	.58	.67	.45	.29	.10
4. Intrinsic motivation			-	.16	-.10	.49	.38	.52	.50	.02
5. Extrinsic motivation				-	.13	-.21	.06	.11	.13	-.18
6. Amotivation					-	-.76	-.65	-.56	-.05	-.17
7. Vigour						-	.71	.84	.22	.10
8. Dedication							-	.67	.38	.18
9. Absorption								-	.26	-.11
10. Engagement									-	.49
11. Unit Score										-

*Note.* *p* values not reported due to the small sample size and large number of bivariate correlations

necessary attributes of people who experience low mood and energy, in order that they do not fall behind. Persistence, however, is not usually an attribute associated with depressive traits.

## Discussion

The low mood and energy trait (depression) was negatively associated with both Engagement and Unit Score in this study. Students who scored highly on this trait had lower levels of engagement with the teaching and learning activities and lower total scores for the unit. While the magnitude of the association was small-to-moderate, it is consistent with the theory that depressive traits are associated with poorer academic outcomes. This finding is also consistent with the results of both Andrews and Wilding (2004) and Eisenberg et al. (2009). In particular, the earlier paper, which investigated associations between depression at the milder end of the spectrum and academic outcomes, is more consistent with the focus in the current

paper on non-clinical levels of low mood and energy. The later paper focused on the clinical manifestation of depression and it is not yet clear how this relates to mood and energy traits.

The negative association between the depressive trait and academic outcomes in the current study is not consistent with the findings of the meta-analysis by Richardson et al. (2012). While they also reported a negative relationship between these variables, the magnitude of the relationship was small ( $r = -.10$ ) and not statistically significant. The scope and scale of this meta-analysis suggests we should consider this the most authoritative investigation of the psychological predictors of academic performance. Nevertheless, the solid theoretical basis upon which the mood and energy traits were investigated in the current study, using the psychological traits underpinning BD as a model, is unique in the extant literature and thus the findings make an important, albeit small, contribution to the literature base.

The high mood and energy trait (hypomania) was not associated with either Engagement or Unit Score. The novel investigation of this relationship therefore suggests that academic outcomes are not predicted by hypomanic traits. The higher levels of mood and energy associated with the hypomanic trait do not appear to be either advantageous or detrimental to academic performance.

Exploration of the comments made by participants in the current study provides important information on possible mechanisms through which low mood and energy traits affect academic performance. Behaviours such as “perfectionism”, “procrastination”, “distraction”, and “[lack of] motivation” were reported by students who scored highly on the depressive trait to describe their main academic weaknesses. Such behaviours are commonly associated with depression in non-academic settings (see, for example, Hewitt, Flett, & Ediger, 1996; Solomon & Rothblum, 1984), so it is no surprise that these behaviours appear in self-reports of academic weaknesses.

It is perhaps through the behaviours associated with low mood and energy traits that changes in academic performance for students with these traits can be affected. The development of psychotherapeutic interventions for low mood and energy traits themselves is a lofty, and perhaps unattainable, goal; if they are indeed traits – stable, inflexible, and pervasive – then this is not the right approach anyway. We can however, develop cognitive-behavioural interventions for perfectionism, procrastination, and poor motivation which are more malleable to change.<sup>2</sup> Indeed, several interventions have already been developed. Scent and Boes (2014), for example, describe a small-group intervention for procrastination based on the principles of Acceptance and Commitment Therapy (ACT) and consisting of

three steps. Firstly, students were encouraged to take “time out” from the task in order to evaluate how their thoughts and feelings were contributing to their procrastination. Secondly, they considered alternative behaviours in response to their current situation. The final step required students to consciously connect their current behaviour with their long-term values and goals, and thus generate actions that are consistent with these values and goals. Initial anecdotal evidence on the effectiveness of this program in reducing procrastination is encouraging, however further testing and refinement is required, as noted by the authors. Another small-group intervention based on cognitive-behavioural techniques including insight, irrational thinking, and mastery/self-worth goals reported similarly encouraging outcomes, both immediately post-intervention and eight weeks later (Uzun Ozer, Demir, & Ferrari, 2013). Again however, further testing and refinement of the intervention is necessary. Cognitive-behavioural interventions aimed at individuals rather than groups have also been developed (e.g. Dryden, 2012; Mandel, 2004; van Essen, van den Heuvel, & Ossebaard, 2004) with varying degrees of success. The cost-effectiveness of individual interventions for academic procrastination requires investigation.

Given that behaviours such as procrastination, distraction, and low motivation are commonly perceived to be consequences of “self-regulatory failure” (Steel, 2007, p. 65), interventions aimed at improving academic self-regulation may also be effective. An online program developed by Rosário et al. (2010) and based on the self-regulated learning model of Zimmerman (2002), has proven successful in increasing academic self-regulatory behaviour amongst University students across a range of cultures and contexts (Rosário et al., 2014). Encouraging outcomes have also been reported

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<sup>2</sup> Note that interventions for perfectionism are controversial given that this behaviour can be associated with improved academic outcomes (Stoeber & Otto, 2006) even though it may not be a psychologically healthy behaviour (Hewitt et al., 1996).



in relation to academic performance (Núñez et al., 2011), although there are no data on how the program interacts with depressive traits to affect academic outcomes. The online format of this program may address concerns regarding the cost-effectiveness of interventions aimed at changing academic behaviours, however further testing of the program in a wider demographic is necessary.

### *Limitations*

The outcomes of the current study are limited by the small sample, particularly the small number of students that volunteered to participate in the follow-up stage of the study. Insufficient power in the design meant that statistical testing of relationships between variables were not reliable. A larger sample is therefore necessary to ensure that relationships can be tested for statistical significance and more complex data analysis techniques such as hierarchical regression models can be applied. A larger sample would also allow us to investigate possible mediators of the relationship between mood and energy traits and academic outcomes. Conscientiousness is often cited as a predictor of academic success (e.g., McAbee & Oswald, 2013) and may mediate the relationship between the variables of interest in the current study, however we did not find this relationship. It is possible that Conscientiousness only predicts academic success at the facet level of analysis (e.g., Competence, Achievement Striving, Self-discipline; see, O'Connor & Paunonen, 2007) rather than at the broader domain level. Insufficient data meant we were unable to test these facet-level relationships in the current study.

### **Conclusion**

The current study provides important information on a novel predictor of academic engagement and performance. Mood and energy traits have received little research attention as predictors of academic outcomes,

even though they would appear to play a substantial role in students' ability to perform at University. The primary strength of the current study was the use of a psychometrically sound instrument in an innovative way to investigate individual differences in these mood and energy traits. The 7 Up 7 Down instrument measures the psychological traits underpinning BD and thus provides a sound theoretical basis for modelling mood and energy traits. Hypomania (the *up* phase) and depression (the *down* phase) are particularly suited to an investigation of individual differences in mood and energy. Even though this model of hypomanic and depressive traits is derived from psychopathology, it is applicable to, and specifically designed for, use in normal populations.

The results of the current study showed that traits of low mood and energy, but not traits of high mood and energy, are associated with compromised academic performance. The mechanisms through which such traits are detrimental to academic performance are not clear and require further investigation. Psychological interventions based on cognitive-behavioural principles and targeted at behaviours that are characteristic of low mood and energy traits may be beneficial in limiting the impact of such traits on academic performance. Cost-benefit analyses of these interventions are necessary to determine their suitability for large-scale application in Universities. The recent development of online programs that target academic self-regulation may progress this field in a cost-effective manner, although exactly how self-regulation relates to low mood and energy traits first needs to be determined.

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