



# A longitudinal investigation of irrational beliefs, hedonic balance and academic achievement



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## ARTICLE INFO

### Keywords:

Positive affect

Negative affect

Academic performance

Rational emotive behaviour therapy

## ABSTRACT

This investigation tested (linear and non-linear) cross-sectional and cross-time associations between irrational beliefs, hedonic balance and academic achievement. In total, 175 undergraduate students ( $M_{\text{age}} = 20.23 \pm 5.06$  years) completed measures of irrational beliefs and hedonic balance at mid-semester and again before their end of semester examinations. Student academic grades were obtained from a university electronic management package. Results showed that higher levels of irrational beliefs (depreciation) were associated with a more negative affective state at mid-semester and increases in negative affect (relative to positive affect) over time. Increases in irrational beliefs (depreciation and awfulising) also coincided with increases in negative (relative to positive) affect. Irrational beliefs and hedonic balance were unrelated to academic performance. In short, this study provides evidence that irrational beliefs are related to change in student affect over time, but that irrational beliefs and hedonic balance are unrelated to objectively measured academic achievement.

## 1. Introduction

There is considerable practical and well as theoretical value in identifying factors that contribute to academic performance. Among member countries of the Organisation for Economic Cooperation and Development, an average of 5.2% of gross domestic product is spent on education (primary to tertiary), and continuation into higher education has increased substantially with 42% of adults now completing tertiary education – an increase from 26% over 30 years (Organisation for Economic Cooperation and Development, 2016). Higher levels of educational attainment is associated with higher employment rates (and lower unemployment rates), better reported health, a reduced incidence of physical limitations, and higher reported life satisfaction (Organisation for Economic Cooperation and Development, 2016). Given the positive outcomes associated with higher educational attainment, identifying factors that contribute to increments in academic success is of critical importance. In this investigation we explore cross-sectional and cross-time associations between irrational beliefs, hedonic balance, and objectively measured academic performance among students in the early phase of tertiary education.

This investigation is grounded within the framework of rational emotive behaviour therapy (REBT; Ellis, 1957), a humanistic cognitive-behavioural approach to psychological well-being. REBT is considered

the original cognitive-behaviour therapy, and was developed as a reaction to what was perceived to be ineffective psychotherapies of the time. REBT (Ellis, 1957) was inspired by the Stoic philosophers and a central tenet of REBT is that events themselves do not cause affective states. Rather, it is beliefs about the events that lead to the experience of positive and negative affect. REBT distinguishes itself from alternative cognitive-behavioural approaches by placing irrational and rational beliefs at its core. Rational beliefs are flexible, non-extreme, and logical whereas irrational beliefs are rigid, extreme, and illogical. Both rational and irrational beliefs can be categorised into four main dimensions. Rational beliefs comprise a primary belief (preferences) and three secondary beliefs derived from the primary belief (anti-awfulising, high frustration tolerance, and self/other acceptance). Irrational beliefs also comprise a primary belief (demandingness) and three secondary beliefs derived from the primary belief (awfulising, low frustration tolerance, and self/other depreciation). Irrational beliefs are at the heart of REBT and are considered the core reason for human misery and dysfunction (Dryden & Branch, 2008; Ellis & Dryden, 1997). Moreover, irrational beliefs are predicted to lead to a greater experience of negative affect and a lower experience of positive affect.

Current models of subjective well-being suggest that affective states fluctuate around a biologically determined set point that rarely changes in the long-term, but that meaningful short term change occurs in

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response to important life events (Lucas, 2007). Much research has demonstrated that irrational beliefs are associated with a greater experience of negative affect (for reviews, see Bridges & Harnish, 2010; Visla, Fluckiger, Grosse Holtforth, & David, 2015). In student populations, cross-sectional research has demonstrated that students reporting a greater experience of irrational beliefs tend to experience more negative affect (David, Schnur, & Belloiu, 2002; Malouff, Schutte, & McClelland, 1992). A prospective study of undergraduate students also found that irrational beliefs measured at mid-term were associated with distress measured both concurrently and immediately prior to an exam (DiLorenzo, David, & Montgomery, 2007). However, as far as we are aware, research has not explored how irrational beliefs for academic achievement (e.g., “It would be catastrophic if I did not perform well in this exam”) relate to the experience of positive or negative affect. Context specific measures can help to establish whether irrational beliefs about academic achievement relate to student affective experience. This is important as negative affect has consistently been linked to poor academic achievement (Callaghan & Papageorgiou, 2014; Chapell et al., 2005; Pekrun, Goetz, Titz, & Perry, 2002).

In line with the notion that irrational beliefs should lead to unconstructive behaviours (Ellis, 1957), researchers have explored whether irrational beliefs are harmful to performance across a variety of settings (for a review, see Turner, 2016). Surprisingly, we were unable to identify any research that had explored associations between irrational beliefs and academic performance. Nevertheless, there is some evidence that REBT (in which irrational beliefs are challenged and replaced with rational beliefs) can improve academic grades. A meta-analysis of five studies (seven independent samples) found that REBT was associated with greater increases in grade point average compared to non-intervention control conditions (Gonzalez et al., 2004). However, two of the five studies found no difference between REBT and control groups, suggesting that further research is warranted. Moreover, the extant research has not sufficiently examined the nature of the relationship between irrational beliefs and academic performance. It has been suggested that some level of irrational thinking could be helpful to performance in some acute circumstances (Turner, 2016; Turner & Barker, 2014). That is, irrational beliefs that enhance negative emotions that have a motivational component (e.g., anxiety) could lead to greater investment and deliberate practice (see e.g., Gable & Harmon-Jones, 2010). In other words, irrational beliefs could suggest to the individual that more effort is required (to avoid failure) leading to some adaptive behaviours (e.g., increased study time). Given this possibility, we test whether the relationship between irrational beliefs and academic achievement is linear or curvilinear in nature.

If irrational beliefs do relate to academic performance, from an REBT perspective it should be through the emotional (and associated behavioural) consequences of irrational beliefs (Ellis & Dryden, 1997). Therefore, it is important to examine affect when attempting to understand the role of irrational beliefs in academic performance. In this investigation we conceptualise positive and negative affect as hedonic balance (the relative amount of positive affect to negative affect). Hedonic balance is often considered a more suitable index of subjective well-being – than separate measures of positive and negative affect – when model predictions target the overall affective experience (Schimmack, Radhakrishnan, Oishi, Dzokoto, & Ahadi, 2002). Similar to previous research (DiLorenzo et al., 2007) we test for concurrent associations and cross-time associations, with irrational beliefs and hedonic balance assessed at mid-semester and prior to student examinations. Based on the REBT framework (Ellis, 1957), we hypothesised that (1) irrational beliefs would be negatively associated with concurrently measured hedonic balance and decreases in hedonic balance over time, (2) that decreases in hedonic balance will coincide with increases in irrational beliefs, (3) that higher levels of irrational beliefs and lower levels of hedonic balance – and increases in irrational beliefs and decreases in hedonic balance over time – would be associated with poorer academic achievement, and (4) that hedonic balance would

mediate a negative association between irrational beliefs and academic achievement.

## 2. Method

### 2.1. Participants

Data were collected from a student sample at mid-semester (Time 1) and at the end of the semester – six weeks later (Time 2). A total of 203 undergraduate students (33 men, 170 women) from a university in the New South Wales region of Australia agreed to take part at Time 1 ( $M_{\text{age}} = 20.32 \pm 5.05$  years). At Time 2, 28 participants did not return resulting in a final sample of 175 participants, and an attrition rate of 16.0%. Compared to those that returned at Time 2, study dropouts had lower levels of hedonic balance at Time 1,  $t(201) = 2.41$ ,  $p = 0.017$ . All other measured variables did not differ between included participants and dropouts. For the final sample, there were 30 men and 145 women aged between 17 and 51 years ( $M_{\text{age}} = 20.23 \pm 5.06$  years). The greater number of women (compared to men) is thought to reflect involvement of men and women in higher education social science.

### 2.2. Measures

#### 2.2.1. Irrational beliefs

The Irrational Performance Beliefs Inventory (IPBI; Turner et al., 2017) is a 28-item self-report scale that measures the four core dimensions of irrational beliefs: primary irrational beliefs (e.g., “I must not be dismissed by my peers”), low-frustration tolerance (e.g., “I can’t bear not succeeding in things that are important to me”), awfulising (e.g., “It’s awful if others do not approve of me”), and depreciation (e.g., “If others think I am no good at what I do, it shows I am worthless”). Participants were asked to rate the 28 statements as they relate to their university education. Because the measure was not developed exclusively for an academic context, item 15 (“I need my manager/coach to act respectfully towards me”) was changed to “I need my lecturer/peers to act respectfully towards me.” Responses were provided on a five-point scale from 1 (*strongly disagree*) to 5 (*strongly agree*). The IPBI has demonstrated construct and concurrent validity in an achievement context (Turner et al., 2017). Moreover, the measure showed strong fit indices (CFI = 0.93, NNFI = 0.92, SRMR = 0.06, RMSEA = 0.07) and large positive correlations between similar subscales of a corresponding measure of irrational beliefs – the shortened general attitude and belief scale (Lindner, Kirkby, Wertheim, & Birch, 1999). In the current study sample, internal consistency coefficients (Cronbach’s alpha) at Time 1 and Time 2 were 0.71 and 0.77 (primary irrational beliefs), 0.78 and 0.81 (low-frustration tolerance), 0.78 and 0.78 (awfulising), and 0.87 and 0.92 (depreciation).

#### 2.2.2. Hedonic balance

The positive and negative affect schedule (PANAS; Watson, Clark, & Tellegen, 1988) is a 20-item self-report scale that measures two dimensions: positive affect (10 items; e.g., “excited”) and negative affect (10 items; e.g., “distressed”). Participants were asked to rate the extent to which they experienced each emotion over the past seven days. Scores are provided on a five-point scale from 1 (*very slight or not at all*) to 5 (*extremely*). The PANAS has shown evidence of test-retest reliability, in addition to construct, convergent and discriminant validity (Crawford & Henry, 2004; Watson et al., 1988). Hedonic balance was computed by subtracting the total negative affect score from the total positive affect score (Allen, Magee, & Vella, 2016; Schimmack et al., 2002). Internal consistency coefficients for positive affect were 0.88 (Time 1) and 0.90 (Time 2), and for negative affect were 0.87 (Time 1) and 0.86 (Time 2).

#### 2.2.3. Academic achievement

Student academic grades for the semester were obtained from a

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