University Students' Threat Perceptions, Mental Health and Well-Being, Hope and Academic Performance

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Abstract

University is known to be a stressful period which has been associated with negative mental health and well-being outcomes. In an already vulnerable population, stress may be compounded by the fear of threatening world events. Threat perceptions too have been linked to maladaptive psychological outcomes, particularly among young people (18 – 24 years). Although this population is one of the most affected, it is also significantly under-researched. This project explores perceptions of threatening world events and predictors of academic achievement within the context of a first-year undergraduate cohort (N = 108). Participants were aged between 18 – 21 years (M = 18.7, SD = 0.87). They completed an online questionnaire which consisted of: a newly developed self-report scale assessing perceptions of threatening world events, and measures of psychological ill-being, well-being, the stress response, and trait hope. Quantitative analyses included Exploratory Factor Analysis, Cronbach's alpha, Pearson's correlation coefficient, multiple regression and relative importance regression analyses. The construct validity of the newly developed scale was inconclusive, but two out of the three extracted subscales had good internal reliability. A main finding of the study was that psychological health was tied into students' pessimism about threatening world events and the negative affect they experienced. Psychological well-being and trait hope were associated with more effective coping with threat. The present study gives insight into how University students are perceiving and coping with threatening world events and provides the groundwork for understanding the support they require in this arena.

Keywords: Threat Perception, Threatening World Events, Psychological Ill-Being, Psychological Well-Being, Stress, Hope, Academic Performance

Declaration

This thesis contains no material which has been accepted for the award of any other degree or diploma in any University, and, to the best of my knowledge, this thesis contains no material previously published except where due reference is made. I give permission for the digital version of this thesis to be made available on the web, via the University of Adelaide's digital thesis repository, the Library Search and through web search engines, unless permission has been granted by the School to restrict access for a period of time.

Tamara Stanisavljevic

21/09/2020

Contribution Statement

In writing this thesis, my supervisor, Dr. Matthew Dry, and I collaborated to generate the research question of interest, develop the aims of the study, and design the appropriate research methodology. I conducted the literature search, completed the ethics application, and preregistered the project. I developed the Qualtrics Survey with a fellow student researcher, Aaron Turner. I was responsible for all participant recruitment and course crediting. Data collection was predominantly completed by me but Dr. Dry sourced the data for one of the research variables – academic grades. I was responsible for data analysis and thesis write-up.

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University Students' Threat Perceptions, Mental Health and Well-Being, Hope, and Academic Performance

University is known to be a challenging period for its students and many will require mental health support during their studies. Common sources of stress include assessment deadlines, examinations, newfound independence and responsibility (Cheung, Tam, Tsang, Zhang & Lit, 2020; Dekker et al., 2020; Farrer, Gulliver, Bennett, Fassnacht & Griffiths, 2016; Morton, Mergler & Boman, 2014). Additionally, students face the task of battling other external stressors. One that has become abundantly clear is the danger, possibility and proximity of threatening world events. In recent years, Australia has seen acts of terrorism in its big cities, bushfires which have called for a state of emergency, and mostly recently, has been subject to a pandemic. Threatening world events pose a risk to human life, and regardless of an individual being personally affected, they may be perceived as harmful stressors (Doherty & Clayton, 2011; Lazarus & Folkman, 1984). Perceptions of threatening world events have been linked to mental health and well-being impacts which, of course, influence other areas of life (Agho, Stevens, Taylor, Barr, Raphael, 2010; Biddle et al., 2020; Stevens et al., 2009b). Young people, particularly those who undertake tertiary education, are a population that is already considered high risk for mental disturbance and illness (Bitsika, Sharpley & Melham, 2010; Chernomas & Shapiro, 2013; Dekker et al., 2020; Stallman, 2010). They are under-researched in the domain of threat perception, and not at all when linking academic performance. This begs the question, how are University student's perceiving and responding to threatening world events, and how is this effecting their academic performance?

1.1 Defining Threatening World Events

'Threatening world events' refers to serious, adverse incidents which have the potential to occur on a global scale. They may pose a risk to human life and the earth's

natural environment. Examples of threatening word events include terrorism, climate change related disasters, and pandemics. Adverse world events are relevant to us all by direct, indirect, or psychosocial means (Doherty & Clayton, 2011). Direct psychological impacts refer to acute effects of personal involvement in a traumatic event. Indirect impacts threaten an individual's mental well-being by second-hand experience and related concerns, such as observing or hearing about an adverse event, or feeling uncertain about the future. Lastly, psychosocial impacts refer to general community effects, such as policies for prevention or post-disaster adjustment (Doherty & Clayton, 2011).

1.2 Widespread Psychological Impacts

Regardless of how a threatening world event is experienced, its impacts reach far and wide. Australia has experienced little terrorism within its borders but is indirectly affected by other large-scale attacks – such as the Bali Bombings, Jakarta Bombings, Mumbai Attacks, September 11, and the London Bridge Attack (Howie, 2005; Stevens et al., 2009b; Stevens et al., 2009a). Climate change on the other hand is a more salient issue in Australia (Manning & Clayton, 2018). It is regarded as the main factor contributing to the country's ongoing drought and annual bushfires (Agho et al., 2010; Manning & Clayton, 2018). Most recently, the world experienced the outbreak of novel Coronavirus Disease (COVID-19) that was declared a pandemic in March of 2020 (World Health Organisation, 2020). Despite being personally affected by these adverse world events or merely witnessing them through media channels, the common thread is that they create an environment of instability and uncertainty about the future (Agho et al., 2010; Stevens et al., 2011).

1.3 Threat Perception and Mental Health Affects

Literature concerning threatening world events has found high threat perceptions among the Australian population and associations with mental health related issues. In Australia, terrorist concern is greater than in other comparable countries like Canada (Stevens

et al., 2009b; Stevens et al., 2011). In one study, almost a third of participants perceived a terrorist attack as very or extremely likely to occur; 42.5% were very or extremely concerned about themselves, their family and friends being affected; and 26.4% had made some level of change due to the perceived possibility of an attack (Stevens et al., 2009b). Research on climate change has shown similar statistics. Agho et al. (2010) identified 62.1% of the population as perceiving climate change to be worsening; 56.3% were concerned that they, their family or friends would be affected; and over three-quarters reported changing their way of living. High levels of concern that self and loves ones would be affected by threatening world events has been consistent across the literature and is no different for pandemic threat. Barr et al. (2008) found that 14.9% of participants perceived high likelihood of pandemic influenza; while 45.5% were very or extremely concerned that they, their family or friends would be affected if it did occur.

Research has shown that younger ages (18 – 24 years) and formal educational qualifications (High School Certificate, Degree and above) are associated with greater threat perception, particularly relating to climate change and pandemics (Agho et al., 2010; Biddle, 2020; Huddy, Feldman, Lahav and Taber, 2003; Reser, Bradley, Glendon, Ellul & Callaghan, 2012). This may be due to the information that young educated persons are seeking out, the peer discourse they are privy to, and their activity on media networks. Young people have been found to disproportionately experience feelings of worry, anxiety, hopelessness and pessimism in relation to threat perception (Bentley, 2004; Fien, Neil & Bentley, 2008; Huddy et al., 2003; Ojala, 2012). Research has shown that participants scoring high on measures of psychological distress were almost twice as likely to perceive greater threat of terrorism and climate change (Agho et al., 2010; Stevens et al., 2009a). This is consistent with research that found a negative relationship between terrorist risk perception and psychological well-being (Cummins, 2008). Similarly, those who were more anxious about the threat of COVID-19

also had higher levels of psychological distress (Biddle et al., 2020). This may be explained by the idea that individuals experiencing distress or anxiety perceive greater likelihood of hazards, make personal threat associations, and hold greater tendencies towards vigilance (Lowenstein, Weber, Hsee and Welch, 2001).

COVID-19 research has also identified increased levels of psychological ill-being and decreased levels of psychological well-being during the pandemic in Australia (Fisher et al., 2020). In the first month of the pandemic (March), around a quarter of the population indicated mild to moderate symptoms of anxiety (24.5%) and depression (26.5%) (Fisher et al., 2020). By April 2020, the proportion of the Australian population surpassing the threshold for clinical mental illness risk, as measured by the Kessler 6 (Kessler et al., 2003), was 10.6% – a substantial and significant increase of 2.2% from 2017 (Biddle et al., 2020). Furthermore, Biddle et al. (2020) noted a significant decrease in life satisfaction during the destructive summer bushfires of 2019 – 20 and COVID-19. A quarterly survey found a significant decline of 0.15 in mean life satisfaction from September 2019 (7.05) to January 2020 (6.90), and an even greater decline of 0.40 later in April 2020 (6.50) (Biddle et al., 2020). Biddle et al. (2020) notes that those in the younger age category (18 – 24 years) reported significantly greater levels of worry and anxiety, and lower levels of life satisfaction as compared to the general population. The younger age category, and students in particular, also had the largest decline in employment. It has been suggested that they were most likely to feel the effects of the pandemic through their drastically altered work and educational life (Biddle et al., 2020). It is evident that mental health and well-being effects are associated with young people's perceptions of threatening world events. In an already stressful University environment, threatening world events may compound pre-existing psychological distress and negatively impact a student's academic performance.

1.4 Psychological Ill-Being and Academic Outcomes

Young adulthood is a challenging time of transition. It is associated with a developmental shift from adolescence to adulthood – a shift in autonomy, responsibility, income, and relationships; and often, a transition from one institution to another – high school to University (Cheung et al., 2020; Morton et al., 2014). During this critical period, University students often struggle with adjusting and managing new academic standards and social integration, as well as balancing multiple areas of life (Dekker et al., 2020; Farrer et al., 2016; Morton et al., 2014). Research has found that young adults are especially vulnerable to psychological distress, with academic pressure being identified a major challenge within this cohort (Bitsika et al., 2010; Chernomas & Shapiro, 2013). Mental health problems are associated with dangerous alcohol consumption, irregular sleep patterns, relationship difficulties and reduced concentration (Bitsika & Sharpley, 2012; Bitsika et al., 2010; Farrer et al., 2016; Tembo, Burns & Kalembo, 2017).

One in three students experiences a mental health-related illness during their time at University; this is a much higher rate than young people in the general population (Bitsika & Sharpley, 2012; Cheung et al., 2020; Dekker et al., 2020; Farrer et al., 2016; Stallman, 2010). In one study, Tembo et al. (2017) found that University students had a 12.9% greater prevalence of psychological distress than comparable participants. Research has also found that University health services had significantly greater proportions of elevated distress levels (83.9%) than what was found in the general population (29%) (Australian Bureau of Statistics, 2008). Furthermore, mental health and academic performance are interrelated. Studying under pressure, study load, procrastination and underperformance have been shown to correlate with depression, anxiety and lower well-being; and students with mental health problems are twice as likely to drop courses and have a higher proportion of unsubmitted assignments (Dekker et al., 2020; Tembo et al., 2017). Moreover, Stallman (2010) found that

for each increasing level of psychological distress, significantly lower Grade Point Average (GPA) scores were associated. Consistent with this, Cheung et al. (2020) found that depression was negatively related to Grade Point Average (GPA) across multiple sub-groups of University students. Given this research, it is important to understand factors that aide and exacerbate mental health so that students can be offered optimal support in protecting their well-being and academic outcomes.

1.5 Psychological Well-Being and Academic Performance

While some students experience mental distress, disturbance and illness during their tertiary education, others cope optimally and thrive through challenging periods. Research regarding mental health and academic performance has predominantly focused on measures of psychological ill-being (Stamp et al., 2015). However, it has been proposed that psychological well-being is a distinct construct that should not be overlooked. Seligman and Csikszentmihalyi (2000) argue that psychological health is not merely the absence of mental illness. Rather it is thought to reflect positive human functioning, specifically, flourishing and reaching one's full potential (Kern, Benson, Steinberg & Steinberg, 2016; Keyes, 2007; Seligman & Csikszentmihalyi, 2000; Stamp, 2015). Although no universal definition of psychological well-being exists, there is a general consensus that it is a multidimensional construct (Kern et al., 2016; Stamp, 2015). A prominent model of mental wellbeing is the EPOCH (Kern et al., 2016). It extends on Seligman's (2011) PERMA model (another popular conceptualisation of psychological well-being) by targeting adolescent and young persons. The EPOCH defines flourishing with five interrelated, biopsychosocial domains: Engagement, Perseverance, Optimism, Connectedness, and Happiness. (Kern et al., 2016). Characteristics of psychological well-being influence 'the good life – feeling good and functioning effectively' (Kern et al., 2016, p. 586) – and are said to predict better outcomes in adolescence and later adulthood.

Psychological well-being has been linked to a range of positive outcomes that hold promising results in student populations. Including better functioning and adaptability in times of stress and adversity (Besser & Zeigler-Hill. 2014; Weinberg, Besser, Zeigler-Hill & Neria, 2016), lower psychological distress, problem-focused coping (Fontaine, Manstead & Wagner, 1993; Morton et al., 2014), positive appraisal, psychological adjustment, and goal-directed performance (Rand, Martin & Shea, 2011). These outcomes can help students cope better with high stress periods, adjust to newfound autonomy and social situations, and develop constructive plans to achieve their academic goals.

Additionally, research has found that positive psychological characteristics predict better academic performance. Collie, Holliman and Martin (2016) identified a positive relationship between engagement and academic achievement in a University sample. The immersed state of students high on engagement increases their chance of achieving flow more regularly, and influences participatory behaviours (i.e. in class or self-direct learning). Unsurprisingly, a positive relationship has also been detected between perseverance and academic grades (Hernandez, Moreno-Murcia, Cid, Monteiro & Rodrigues, 2020). These benefits are seen in students' persistence on tasks and resilience in response to setbacks. In contrast, the relationship between optimism and academic performance has been inconsistent. Researchers have generally found no significant relationship or a small one at best (Chemers, Hu & Garcia, 2001; Feldman & Kubota, 2015; Rand et al., 2011). Nevertheless, it has been suggested that optimism influences better academic performance by indirect means, such as expectancies for the future and adaptive coping style (Feldman & Kubota, 2015; Rand et al., 2011). Although the research on psychological well-being and academic performance is limited, it indicates that mentally healthy individuals are able to cope with educational stressors and persist through challenges effectively. Thus, further exploring this construct in educational settings would be valuable.

1.6 Defining the Stress Response

Stress is a universal phenomenon that can loosely be defined as an individual's response to demanding stimuli of physical or psychological nature (Branson, Turnbull, Dry & Palmer, 2019b; Kumar, Shrama, Gupta, Vaish & Misra, 2014; O'Sullivan, 2011). It is commonly conceptualised as a detrimental and undesirable state. However, contemporary stress models, such as the Transactional Approach (Lazarus & Folkman, 1984) and the Holistic Stress Model (Nelson & Simmons, 2003), highlight the distinction between a negative stress response and a positive stress response – termed 'distress' and 'eustress' – and emphasise that stress can be advantageous rather than maladaptive (Branson, Dry, Palmer & Turnbull, 2019a). Distress and eustress are separate constructs (Branson et al., 2019a). Distress can be thought of as a negative psychological response to stimuli, associated with irritability, frustration, isolation, anxiety and burnout. While eustress has been termed a positive psychological stress response, associated with hope, perceived efficacy, manageability, productivity and meaning – yet it is much less researched (Nelson & Simmons, 2003; O'Sullivan, 2011). It has been suggested that a stress response is dependent on an individual's subjective appraisal of their ability to cope with the given stimuli, rather than the valence of the stimuli itself (Lazarus & Folkman, 1984). If an individual deems their coping ability inadequate, they experience distress. Conversely, if an individual deems their coping ability adequate, they experience eustress. These concepts are particularly relevant in the academic arena where stressors are prevalent among University students.

1.7 Academic Stress and Subsequent Outcomes

Academic stress is brought on by stimuli such as assessment deadlines, examinations, high workload, concern about career direction, and grades (Akgun & Ciarrochi, 2010; Chua, Ng & Sang, 2018). Academic related stress has been linked to poor physical and mental health, and academic underperformance (Akgun & Ciarrochi, 2010). Research exploring

distress and academic performance in University samples has generally identified an inverse relationship (Akgun, 2010; Blumberg & Flaherty, 1985). Kumar et al. (2014) found that increasing distress levels (mild, moderate to severe) were associated with decreasing cumulative grades. Additionally, they demonstrated a positive correlation between eustress and academic outcomes (Kumar et al., 2014). Consistent with this finding, Chua et al. (2018) found that Malaysian University students perceiving stressors in a positive light were more likely to exhibit eustress and subsequently had better academic outcomes. However, they did not find a significant correlation between distress and academic performance (Chua et al., 2018). It was proposed that this may be unique to collectivist culture's where success is highly regarded among communities. These findings imply that distress is detrimental to academic performance, perhaps due to impaired cognition, poor concentration and retention, and increased mental fatigue (Kumar et al., 2014). Eustress, on the other hand, has beneficial academic outcomes. Understanding the stress response in relation to academic performance could be valuable in developing students' resilience against stressors, tools for positive appraisal, and ultimately, supporting students' academic performance.

1.8 Hope Theory

A construct related to eustress that has gained much attention in the literature on academic performance is hope. Hope has been defined as a cognitive appraisal of a given situation as not only changing, but improving in the future (Lazarus, 1999). It has been proposed that hope is a coping resource as well as a motivational state (Lazarus, 1999; Snyder, 1995; Weinberg et al., 2016). A popular conceptualisation is outlined by Snyder's (1995) Hope Theory. Hope Theory suggests that humans are innately goal-directed and that they engage in two interrelated processes when pursuing their goals: 1) Pathways Thinking, which involves producing practical routes (or pathways) to attain a goal; and 2) Agency

Thinking, which involves the perceived capacity to attain the given goal/s utilising the chosen pathways (Snyder et al., 1991; Snyder, 1995; Snyder, 2002).

Individuals that are higher on hope are described as flexible thinkers. They tend to produce multiple routes to goal attainment, update their pathways effectively, and rebound at a faster rate when a pathway becomes blocked (Snyder, 2002). Additionally, they engage in more positive self-talk – "I can do this" – which increases motivation and reinforces one's ability to attain goals. This becomes particularly useful when individuals are faced with challenges (Snyder et al., 1991; Snyder, 2002). Hope has been linked to favourable outcomes in various domains, such as physical health, mental health and well-being, athletic performance, and education to name a few (Besser & Ziegler-Hill, 2014; Breznitz, 1986; Snyder, 2002). Ultimately, the interplay between the two hope components allows individuals to act and think in a way that brings them closer to their goals.

1.9 Hope as a Predictor of Academic Performance

Given the motivated and goal-directed state of individuals with higher hope levels, it is not surprising that hope has been linked to better academic performance in primary school, high school and University samples. Research has found significant relationships between hope and course grades, cumulative semester grades, and GPA in University students, even when controlling for intellectual ability (Chang, 1998; Feldman & Kubota, 2015; Rand et al., 2011; Snyder et al., 2002). However, effect sizes generally range from weak to moderate, and inconsistencies have been found. For example, Rand et al. (2011) found a significant relationship between hope levels and law school admissions test grades, but no relationship with GPA. On the other hand, Feldman and Kubota (2015) identified a significant relationship between trait hope and GPA. Moreover, in their six-year longitudinal study following students from their first semester of University, Snyder et al. (2002) found that the

higher hope group was associated with lower course drop-out rates and a higher graduation rate.

Researchers propose that the positive academic outcomes of high-hope students could be consequences of coping effectively with stress, in particular, exhibiting eustress (Chang, 1998; O'Sullivan, 2011; Snyder et al., 1991; Snyder, 2002). Chang (1998) identified greater levels of problem-focused coping in high-hope University students, and in line with pathways and agency thinking, he noted that they engage in significantly less wishful thinking and counterproductive negative thoughts and emotions. Likewise, Snyder et al. (2002) demonstrated that students with higher hope levels felt more energised through stress, found benefits in stressful situations and maintained healthy wellbeing. There is merit in exploring trait hope in high-pressure University settings given the aforementioned research and the proactive characteristics of high-hope individuals.

1.10 Links between Hope, Eustress and Coping with Threat

Hope and eustress are closely related constructs, both of which have been named problem-focused coping resources, and thus may have beneficial outcomes for students who are concerned about threatening world events (Besser & Ziegler-Hill, 2014; Lazarus, 1999; O'Sullivan, 2011; Snyder, 2002). Not only are they both concerned with productivity, perseverance, perceived efficacy, and positive self-talk, they are also characterised by thriving through challenges (Besser & Ziegler-Hill, 2014; O'Sullivan, 2011; Snyder, 2002). Threat is a form of stressor, but as Lazarus and Folkman (1984) have noted, the subjective appraisal of it is the meaningful element that determines how it is experienced. Research has shown that both hope and eustress are related to positive appraisal (Besser & Ziegler-Hill, 2014; Branson et al., 2019b). Snyder (2002) has suggested that high-hope individuals are more likely to perceive a stressor as a challenge rather than a threat, leading to lesser maladaptive feelings of distress. Cohen-Chen, Crisp and Halperin (2015) add to this by

proposing that hope involves the cognitive appraisal that positive change is realistically possible. Likewise, eustress involves feeling determined and motivated to move through a stressor, rather than succumb to it (Branson et al., 2019a). In the context of threatening world events, individuals higher on hope and eustress may perceive adverse world events in a more optimistic light, thus having better outcomes. Cognitive appraisal to stressful situations is also said to have an influence on psychological adjustment (Chang & DeSimone, 2001; Lazarus & Folkman, 1984). Research has shown that hope is associated with adaptation in response to multiple induced stressors, evidenced by fewer mood disturbances and sustained positive affect (Besser & Ziegler-Hill, 2014; Kwon, 2002). The positive nature of appraisals, along with the forward-oriented and motivated state of high- hope and eustress individuals, may hold beneficial impacts for coping with threatening world events and the psychological health of students.

1.11 Intellectual and Personality Predictors of Academic Achievement

Finally, it is important to consider well-established predictors of academic performance in this research. Not surprisingly, intellectual ability is one meaningful determinant of academic outcomes, and arguably the most documented. Research has consistently demonstrated that higher levels of intellectual ability are associated with higher overall grades, albeit the strength of this relationship fluctuates across different cohorts (Busato, Prins, Elshout & Hamaker, 2000; Chamorro-Premuzic & Furnham, 2003; Dry, Due, Powell, Chur-Hansen & Burns, 2018; Farsides & Woodfield, 2003).

Personality traits have also been identified as valuable predictors of academic performance, although there are mixed findings for some of them. A dominant model of personality is Costa and McCrae's (1992) Five-Factor model, including: Openness to Experience, Conscientiousness, Extraversion, Agreeableness, and Neuroticism. This model is widely acknowledged as capturing the entire domain of personality dispositions (Farsides &

Woodfield, 2003; O'Connor & Paunonen, 2007). In regards to academic achievement, the Big Five personality factors have been shown to account for variance beyond that of intellectual ability (Busato et al., 2000; De Feyter, Caers, Vigna & Berings, 2012; O'Connor & Paunonen, 2007). The most promising trait in this domain appears to be Conscientiousness. Conscientiousness is associated with achievement-orientation, self-discipline, persistence, organisation, and motivation (Chamorro-Premuzic & Furnham, 2003; Dry et al., 2018; O'Connor & Paunonen, 2007). Research has demonstrated that this trait determines a range of academic outcomes including GPA, exam grades and general assessments (Chamorro-Premuzic & Furnham, 2003; Conard, 2006; De Feyter et al., 2012). Meta-analyses have found Conscientiousness to be the most strongly and consistently related personality trait to academic achievement (O'Connor & Paunonen, 2007). The literature linking intellectual ability and Conscientiousness to academic performance is important to consider when assessing how other variables influence student achievement.

1.12 Research Aims

In this paper, we explore University students' perceptions of threatening world events, their psychological health, stress response, trait hope levels and academic performance. In order to measure students' perceptions of threatening world events, we have developed a new measure, termed Perception of Threatening World Events Questionnaire (POTWEQ). We hope to gain an understanding of how students are coping with threatening world events, whether there is a need for psychological or academic support, and which factors influence better psychological and academic outcomes. The present study has three research aims:

1. Evaluate the reliability and validity of the POTWEQ.
2. Explore the relationships between University students' perceptions of threatening world events, and their psychological ill-being, psychological well-being, stress response, and hope levels.

3. Test the relationship between psychological ill-being, psychological well-being, stress response, hope and academic performance, while controlling for well-established predictors of academic achievement.

Method

2.1 Participants

The following research was conducted at the University of Adelaide, South Australia. The sample (*N*= 108) was comprised of first-year undergraduate students enrolled in Psychology 1A, a first semester course. All participants were aged between 18 and 21 years of age.

2.2 Measures

An online survey was conducted via QualtricsXM. It consisted of five demographic-related questions, six previously established scales, and a newly developed scale as described below. It should be noted that the data in this research was collected as part of a larger study which included additional measures not mentioned in this report.

Raven's Advanced Progressive Matrices Short-Form. The Raven's Advanced Progressive Matrices Short-Form (APM-SF; Bors & Stokes, 1998) is a measure of intellectual ability. It consists of 12 items and involves a range of perceptual analytic reasoning tasks. Participants are shown a pattern matrix which has a blank space in it. They are provided eight figure alternatives that potentially fit the blank space. One only figure correctly satisfies the inferred row and/or column rules of the matrix. Participants are required to select the figure they believe appropriately fits the blank space of the pattern matrix. Internal reliability for the APM-SF ranges from $\alpha = 0.80 – 0.90$. Test-retest reliability ($r = 0.83$) is also good (Bors & Stokes, 1998).

Openness Conscientiousness Extraversion Agreeableness Neuroticism Index Condensed. The Openness Conscientiousness Extraversion Agreeableness Neuroticism Index Condensed (OCEANIC; Schulze & Roberts, 2006) is a multidimensional, self-report scale which measures the Big Five personality constructs. It consists of 45 items, nine per each factor, which are rated on a 6-point scale. Responses range from (1) *never* to (6) *always.*

Participants are asked to indicate how frequently each item (i.e. 'I am organised', 'I am talkative') applies to them. Internal reliability for the five domains ranges from α = 0.77 – 0.91.

EPOCH Measure of Adolescent Well-Being. The EPOCH (Kern et al., 2016) is a self-report measure which assesses positive mental well-being across five psychological characteristics: Engagement – involvement and absorption in life activities; Perseverance – pursuing tasks despite challenges; Optimism – confidence and hopefulness for the future; Connectedness – fulfilling interpersonal relationships; and Happiness – positive emotion and enjoyment of life. It consists of 20 items, four per each domain, which are rated on a 5-point Likert scale. Responses range from (1) *almost never* to (5) *almost always.* Participants are required to indicate the extent to which they agree with each statement (i.e. 'I finish whatever I begin', 'In uncertain times, I expect the best'). Internal reliability ranges from α = 0.77 – 0.94 (Kern et al., 2016).

Depression Anxiety Stress Scales-21. The Depression Anxiety Stress Scales-21 (DASS-21; Lovibond & Lovibond, 1995) is a multidimensional, self-report scale which measures the negative emotional states of depression, anxiety, and stress. The scale consists of 12 items, seven per domain, and uses a 4-point rating scale. Responses range from (0) *never* to (4) *almost always.* Participants are required to indicate how much each statement has applied to them over the past week (i.e. 'I found it hard to wind down', 'I felt downhearted and blue'). Internal reliability scores in a non-clinical adult sample were as follows: α = 0.94 for Depression; α = 0.87 for Anxiety; and α = 0.91 for Stress.

Adolescent Distress-Eustress Scale. The Adolescent Distress-Eustress Scale (ADES; Branson et al., 2019a) is a self-report measure which captures both facets of the stress response, distress and eustress. It consists of 10 items, five per each domain, which are rated on a 5-point Likert scale. Responses range from (0) *not like me* to (4) *very much like me.*

Each item relates to how one might respond to pressure (i.e. 'I felt overwhelmed', 'I felt motivated'). Participants are asked to indicate how much each statement has applied to them over the past week. Internal reliability scores were found to be $\alpha = 0.87$ for the ADES-Distress scale, and $\alpha = 0.83$ for the ADES=Eustress scale (Branson et al., 2019a).

The Trait Hope Scale. The Trait Hope Scale (THS; Snyder, 2002) is a multidimensional, self-report scale which measures trait levels of hope. The dimensions of this scale include Pathways Thinking and Agency Thinking as according to Hope Theory. When administered, it is labelled 'The Future Scale'. The THS consists of 12 items, four per each domain, and four distractor items. All items are rated on an 8-point scale, ranging from (1) *definitely false* to (8) *definitely true.* Participants are asked to indicate the extent to which each item describes them (i.e. 'There are lots of ways around any problem', 'I energetically pursue my goals'). Internal reliability scores for the overall scale range from $\alpha = 0.74 – 0.88$.

Perception of Threatening World Events Questionnaire. The POTWEQ is a newly developed self-report scale which measures perceptions of adverse world events. Participants are initially given a definition of these events as 'serious incidents which have the potential to occur globally'. Examples provided include 'terrorism, climate change related disasters, and pandemics'. The POTWEQ consists of 14 items which are rated on a 5-point Likert scale. Responses range from (1) *not like me* to (5) *extremely like me.* Participants are asked to indicate the extent to which they agree with each question or statement (i.e. 'I feel panicked when I think about threatening world events', 'I know everything will be okay even in the worst of times').

Academic Performance. In this study, academic performance is measured as participants' averaged Semester 1 grade at the University of Adelaide.

2.3 Procedure

Ethics approval was granted by the University of Adelaide: School of Psychology Human Research Ethics Sub-Committee (reference number: H-20-19). All first-year Psychology students at the University of Adelaide were invited to take part in the present study via an online Research Participation System. Inclusion criteria consisted of participants being 18 – 21 years old and proficient in English. A research description was provided, and voluntary participation was made available with a self-enrolment feature. A more detailed information sheet outlined the research background, what participants were being invited to do, how much time participation would take, and the associated risks and benefits of the study. Participants were supplied with multiple resources for counselling and mental health services granting the potential for discomfort to arise. Contact information for the Human Research Ethics Committee at the University of Adelaide was also given in the case of complaints and/or concerns. Ethical considerations emphasised the processes taken to ensure participants' anonymity, privacy and confidentiality, and their right to withdraw. Informed consent was gained with a check box which allowed participants to proceed to an online survey.

The online survey was presented on QualtricsXM. A 'Save and Continue' feature was installed so that participants could complete the survey as was convenient and to avoid respondent fatigue. Participants were informed that they would receive one course credit for their participation in the study. Once participants had completed the survey, they were offered the option to receive a summary of findings once the research was complete.

When data collection was finalised, the data was screened. Participants were excluded from the final dataset on the basis of: 1) being outside of the 18 – 21-year-old age bracket, 2) incomplete survey entries, 3) obvious cases of random responding and survey speeding, and 4) academic grades that were equivalent to a Fail mark (< 49).

Principal Components Analysis (PCA) was conducted using RStudio to extract latent variables in the dataset. PCA is a data reduction technique which allows us to capture as much information in the original variables as possible while reducing the number to a simpler solution (Kabacoff, 2011). Two latent variables were extracted which we have termed 'Psychological Well-Being' and 'Psychological Ill-Being'. Psychological Well-Being was generated from the EPOCH subscales (Table 1), while Psychological Ill-Being was generated from the DASS-21 subscales (Table 2).

2.4 Data Analysis

Data analysis was conducted in RStudio. Descriptive statistics were calculated to understand the sample in terms of age, gender, level of education, study load and cultural background. We then moved onto measuring the psychometric properties of the POTWEQ. To assess construct validity and inform the dimensions of the POTWEQ, Exploratory Factor Analysis (EFA) was conducted. To estimate internal reliability, Cronbach's alpha was computed. A correlation coefficient of 0.7 is considered acceptable, though > 0.8 indicates good internal reliability (DeVellis, 2016). Note that further analysis comprised of $N = 105$ due to three outliers in the academic performance data being excluded. Correlation analysis was conducted using Pearson's *r.* This produced effect sizes and significance values among all variable relationships. To understand which variables made a significant contribution to the regression prediction for academic performance, a multiple regression model was computed. Then, relative importance regression informed how much variance each variable accounted for in academic performance.

Table 1

Psychological Well-Being Principal Components Analysis

Domain	**Component Loading**
Engagement	0.71
Perseverance	0.73
Optimism	0.79
Connectedness	0.65
Happiness	0.86

Note. N = 108. Proportion Variance Explained = 57%

Table 2

Psychological Ill-Being Principal Components Analysis

Domain	**Component Loading**
Depression	0.88
Anxiety	0.86
Stress	0.95

Note. N = 108. Proportion Variance Explained = 81%

Results

3.1 Descriptive Statistics

The average age of the sample was 18.7 (*SD* = 0.87). Table 3 indicates that roughly three-quarters of participants were women. The majority of participants had completed High School as their highest level of education and had a full-time study load at University. A range of different cultures were identified, with Asian backgrounds being the most prevalent.

Table 3

Descriptive Statistics for Categorical Data

Characteristic	*N*	%
Gender		
Female	83	76.9
Level of Education		
High School Certificate	88	82.2
Study Load		
Full-time Study Load	103	95.4
Cultural Background		
Asian	33	30.6
Australian	28	25.9
Other	20	18.5
Bicultural	13	12.0
Middle Eastern	7	6.5
European	4	3.7
African	3	2.8

Note. N= 108.

3.2 Power Analysis

Post-hoc Power Analysis was conducted using RStudio. The sample size, effect size and alpha levels were known. Given a sample size of 108, an accepted effect size of 0.19, and an accepted alpha of < 0.05, the level of power for this study was 0.51. This means that we have a 51% chance of correctly rejecting the null hypothesis in this research. Unfortunately, this does not achieve the conventionally accepted power level of 80%. Thus, the results of this study should be interpreted with caution.

3.3 Psychometric Properties of the POTWEQ

3.3.1 Construct Validity

EFA was conducted to assess whether the POTWEQ was measuring what it was designed to measure and to better understand the dimensions of this newly developed scale. To test the sampling adequacy of the 14 POTWEQ items for EFA, we computed the Kaiser-Meyer-Olkin value (Kaiser, 1974). Kaiser (1974) suggests a threshold of > 0.60 for reaching statistical significance. We concluded that the POTWEQ items were suitable (KMO = 0.77) for EFA. Scree plot, parallel analysis and Eigenvalues > 1 suggested the presence of three factors. EFA was conducted using a three-factor solution, Promax (oblique) rotation, and Principal Axis Factoring Method. This confirmed that the three factors had Eigenvalues > 1 and accounted for 58% cumulative variance. Fit indices suggested that the model was not an appropriate fit for the data, χ^2 (91) = 162.36 (p < .001), RMSEA = 0.14, TLI = 0.755. Scholars generally suggest that indicators of good fit are RMSEA values < .05 and TLI values > 0.90 (Chen, Curan, Bollen, Kirby & Paxton, 2008; Finch, 2020; Hu & Bentler, 1999). To further explore model fit, we conducted EFA with a four-factor solution, Promax rotation, and Principal Axis Factoring Method. This model indicated improved fit (χ^2 (91) = 73.3 (p < .01), RMSEA = 0.085, TLI = 0.909), yet it was still not optimal. We chose to retain the three-factor extraction despite poor model fit. This decision was primarily driven by the scree plot,

parallel analysis and Eigenvalues indicating three factors. In addition, the three-factor solution was more interpretable and satisfied the notion that an EFA model should be as parsimonious as possible (Finch, 2020).

Due to poor fit indices, we could not confidently state that the POTWEQ had good construct validity. However, the three derived factors were interpretable in their own right. We have named them: 1) POTWEQ-Pessimism, 2) POTWEQ-Affect, and 3) POTWEQ-Coping. All 14 items were retained on the basis of having factor loadings > 0.30 (see Table 4). Items loading on the first factor appeared to be measuring a pessimistic view of threatening world events; items loading on the second factor were measuring negative affect in relation to threatening world events; items loading on factor three seemed to be measuring coping adaptively with threatening world events. Inter-correlations between the three factors were mixed (see Figure 1). POTWEQ-Pessimism and POTWEQ-Affect had a positive and moderate correlation, this indicates that the two dimensions are related but not the same. The relationship between POTWEQ-Pessimism and POTWEQ-Coping was negative and weak, this demonstrates that these two latent variables act as relatively independent factors. The relationship between POTWEQ-Affect and POTWEQ-Coping was negligible.

3.3.2 Internal Reliability

Internal reliability was tested for each POTWEQ subscale using Cronbach's alpha. According to DeVellis (2016) principles, both factor one and factor two had good internal reliability (POTWEQ-Pessimism: $\alpha = 0.82$; POTWEQ-Affect: $\alpha = 0.89$). However, internal reliability for factor three was questionable (POTWEQ-Coping: $\alpha = 0.69$). As it did not reach the accepted Cronbach's alpha level of 0.70, this subscale may need to be refined in the future.

Table 4

Exploratory Factor Analysis Pattern Matrix for the Three Factor Solution

	Factor		
Item	**1**	**2**	**3**
I believe things do not ever seem to be going the way they should in the world.	**0.82**	0.15	0.06
I believe things do not every seem to be going right in the world.	**0.79**	-0.12	0.06
I do not expect good things to come in the world.	**0.72**	-0.02	0.00
I anticipate more good than bad to come in the world.	**-0.63**	0.15	0.36
The future looks bright despite TWE.	**-0.57**	-0.06	0.45
How likely do you think it is that TWE will worsen in the future?	**0.39**	0.15	0.06
I feel overwhelmed when I think about TWE.	-0.12	**0.99**	-0.04
I feel anxious when I think about TWE.	-0.03	**0.93**	0.06
I feel panicked when I think about TWE.	-0.07	**0.91**	-0.01
How concerned are you that you, your family and friends could be directly affected by TWE?	0.22	**0.51**	0.29
I feel determined to make a positive difference when considering TWE.	0.15	0.05	**0.81**
I feel motivated to make a positive change when considering TWE.	0.07	0.08	**0.69**

I know everything will be okay even in the worst of times.	-0.39	-0.15	**0.54**
I feel satisfied with how I deal with the fear of TWE.	0.02	-0.39	**0.39**
Eigenvalues	2.90	3.09	2.09
% of Variance	22.0	21.0	15.0

Note. *N* = 108. Major factor loadings (> 0.30) are bold. TWE = threatening world events. 1 = POTWEQ-Pessimism; 2 = POTWEQ-Affect; 3 = POTWEQ-Coping.

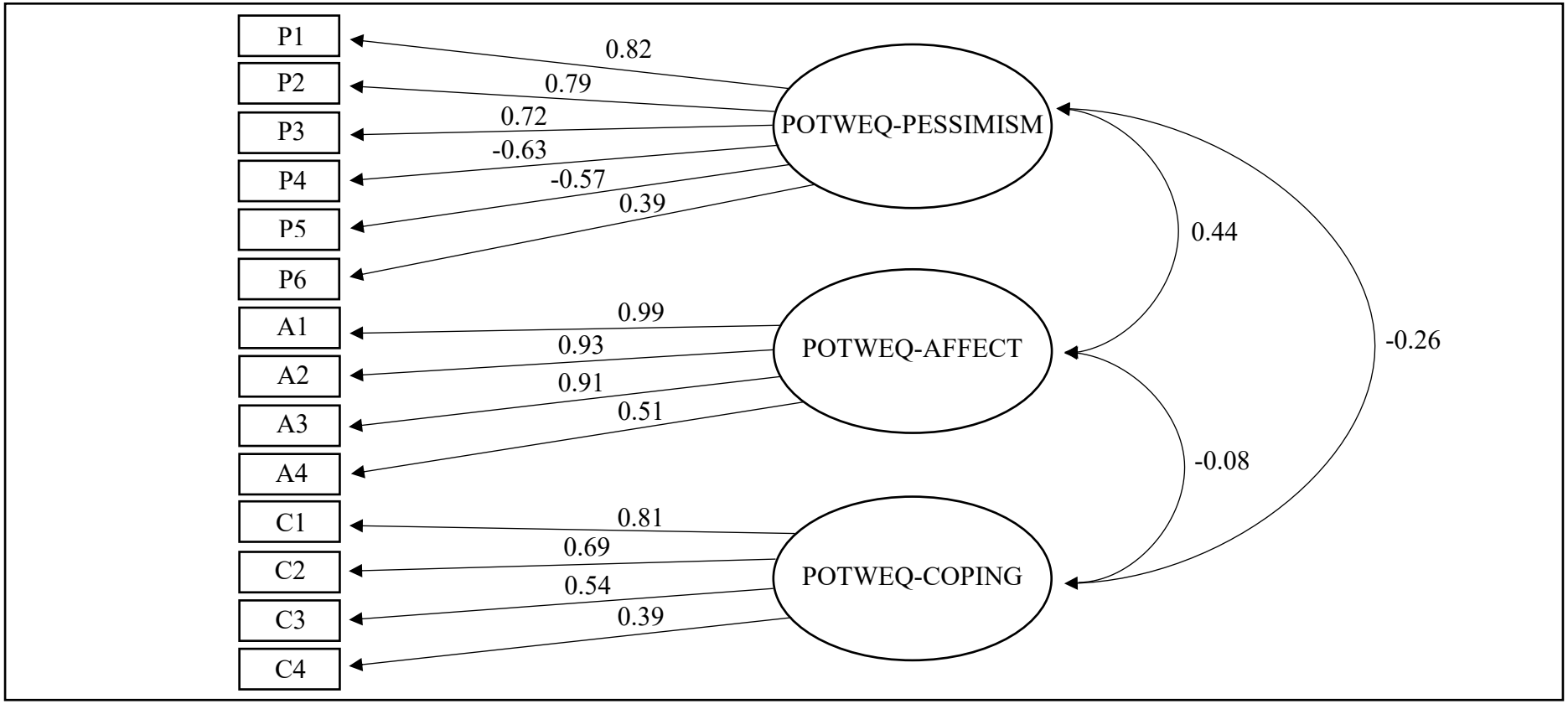

Figure 1. Exploratory Factor Analysis Three-Factor Solution: Inter-correlations between Items and Factors. P = Pessimism; A = Affect; C = Coping.

3.4 Correlation Analysis

Pearson's correlation coefficients among the research variables can be seen in Table 5. The maladaptive POTWEQ subscales – Pessimism and Affect - were significantly correlated with psychological ill-being and distress. Out of the two subscales, only POTWEQ-Pessimism was negatively correlated with psychological well-being. POTWEQ-Coping, on the other hand, had significant relationships with the positive psychological variables well-being, eustress and hope. As expected, intellectual ability and conscientiousness were found to significantly predict academic grades. However, these were the only two variables that indicated a meaningful relationship with student performance. Although the correlation between psychological ill-being and grades was not significant, it did appear to suggest a small, negative relationship. Other meaningful relationships included negative correlations between intellectual ability and psychological well-being, hope and POTWEQ-Coping.

3.5 Regression Analyses

To further understand predictors of academic performance, we ran two regression models. As previous research has suggested, intellectual ability and the personality trait conscientiousness consistently predict better academic grades. Thus, regression Model 1 estimated the proportion of variance in student grades that was accounted for by intelligence and conscientiousness. Then, regression Model 2 estimated the proportion of variance in student grades that was accounted for by the well-established predictor variables *and* psychological ill-being, well-being, distress, eustress and hope. Moreover, relative importance regression analysis was conducted to explore how much variance explained by the model was attributable to each individual regressor. The results of the regression analyses are presented in Table 6.

Table 5

Zero-Order Correlations among all Research Variables

Variable	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
1. POTWEQ-Pessimism	-	0.48***	-0.31**	0.54***	-0.47***	0.51***	-0.44***	-0.45***	0.18	-0.20*	0.05
2. POTWEQ-Affect		-	-0.06	0.39***	-0.07	0.46***	-0.26**	-0.16	-0.02	0.00	0.06
3. POTWEQ-Coping			-	-0.23*	0.56***	-0.21*	0.23*	0.45***	-0.27**	0.25*	-0.08
4. Psychological Ill-Being				-	-0.57***	0.71***	-0.37***	-0.49***	0.08	-0.25*	-0.13
5. Psychological Well-Being					-	-0.39***	0.48***	0.70***	-0.26**	0.48***	0.02
6. Distress						-	-0.31**	-0.28**	0.08	-0.13	0.02
7. Eustress							-	0.47***	-0.05	0.29**	0.06
8. Hope								-	-0.19*	0.46***	0.07
9. Intellectual Ability									-	0.04	0.39***
10. Conscientiousness										-	0.21*
11. Academic Performance											-

Note. $N = 105$. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$. Correlations = Pearson's r.

Table 6

Hierarchical Regression Models

	Step 1				**Step 2**			
	Beta	*t*	*p*	RI	Beta	*t*	*p*	RI
Intercept	63.91	13.35	< 0.001	-	61.11	7.10	< 0.001	-
Intellectual Ability	1.26	4.30	< 0.001	0.15	1.26	4.04	< 0.001	0.15
Conscientiousness	0.24	2.15	< 0.05	0.04	0.20	1.52	0.132	0.03
Psych. Ill-Being	-	-	-	-	-2.29	-1.84	0.072	0.02
Psych. Well-Being	-	-	-	-	-0.48	-0.39	0.701	0.00
Distress	-	-	-	-	0.28	1.43	0.156	0.00
Eustress	-	-	-	-	0.02	0.09	0.930	0.00
Hope	-	-	-	-	0.03	0.16	0.873	0.00
	F [12.1, 2] = 102		R^2 = 0.19		F [3.979, 7] = 97		R^2 = 0.03	

Note. N = 105. Beta weights are unstandardised. RI = Relative Importance: independent contribution of an individual regressor to the variance explained by the model.

For both Model 1 and 2, the *F* statistics indicated statistical significance. The proportion of variance accounted for in academic performance was slightly greater in Model 2 – an additional 3% of variance was accounted for. As expected, intellectual ability made a significant contribution to grades in Model 1 and Model 2. Relative importance regression analysis indicated that the independent variance explained by intelligence was around 15%. Conscientiousness made a significant contribution to grades in Model 1, with independent explained variance accounting for 4%. However, with the addition of more predictor variables in Model 2, the contribution attributable to conscientiousness was no longer significant. We suggest that this is due to multicollinearity and will consider this further in the discussion. Due to the other predictor variables not producing meaningful zero-order correlations with academic performance, it was not surprising that they did not make a significant contribution to regression Model 2.

Discussion

4.1 Summary of Findings

The primary aim of this study was to explore the relationships between University students' perceptions of threatening world events, their mental health and well-being, hope levels, and academic performance. The results of our analyses indicated that, in general, students with better psychological health had lower threat perceptions of adverse world events, and that for students with more concerning psychological health, the inverse was true. Intelligence and conscientiousness were the only variables found to be significant predictors of academic performance. Regression analyses demonstrated that intellectual ability was the stronger predictor of the two.

4.2 Scale Development and Evaluation

To measure perceptions of threatening world events, we developed a new scale known as the POTWEQ. The POTWEQ was systematically developed in accordance to DeVellis (2016) principles as much as was practicable. We took an unconventional approach in generating the 14 items. Rather than beginning with a large item pool and refining it (DeVellis, 2016), we began with a smaller number of items which were purposefully selected on the premise that they would relate to threat perception, as had been outlined in past research. POTWEQ items were based off of selected items in the following questionnaires: Population Health Survey (NSW Ministry of Health, 2007; NSW Ministry of Health, 2008; NSW Ministry of Health, 2009; NSW Ministry of Health, 2011), Perceived Threat (Davydova, Pearson, Ballew & Schuldt, 2018), DASS-21 (Lovibond & Lovibond, 1995), ADES (Branson et al., 2019a), and the Optimism subscale in the EPOCH (Kern et al., 2016).

The use of the POTWEQ in this study was essentially a pilot test with which we could undertake preliminary psychometric analyses (DeVellis, 2016). Research aim #1 was to evaluate the reliability and validity of the POTWEQ. Using EFA, we explored the construct

validity and dimensions of this new measure. Three factors emerged in the analysis which we retained as subscales – POTWEQ-Pessimism, POTWEQ-Affect and POTWEQ-Coping. For future reference, the scores for each domain can be calculated by summing the relevant items (see Appendix A). Although all 14 items were retained and the three subscales were interpretable, EFA fit indices suggested that the model could be improved. Therefore, we cannot confidently conclude that the POTWEQ has good construct validity and it should be validated further. Next, we explored the internal reliability of each POTWEQ subscale. POTWEQ-Pessimism and POTWEQ-Affect had good internal reliability. We conclude that the items in these two domains are consistently measuring the same construct. On the other hand, the internal reliability of POTWEQ-Coping was doubtful. The Cronbach's alpha level for this subscale was 0.01 below the accepted convention. Although this is somewhat promising, we do not accept this level of internal reliability and will make suggestions for future improvement.

In this research, we took an exploratory approach to developing and evaluating the POTWEQ. Due to this, a-priori predictions could not be made, thus, convergent and discriminant validity could not be assessed. However, correlation analysis has given us an indication of what the subscales appear to be measuring and what distinguishes each domain. For example, POTWEQ-Pessimism and POTWEQ-Affect had positive relationships with psychological ill-being and distress. Pessimism is associated with negative outcomes, such as depression, anxiety and stress (Scheier, Carver & Bridges, 1994; Scheier, Carver & Bridges, 2001), so it is not surprising that we see these relationships. Yet, what differentiates the two subscales is that only POTWEQ-Pessimism was negatively correlated with psychological well-being. Importantly, POTWEQ-Pessimism had a moderate, negative relationship with the raw variable optimism (r = -0.55), which provided information about the nature of this subscale. Further, POTWEQ-Pessimism had a moderate, negative relationship with trait

hope. Correspondingly, pessimistic individuals are less likely to exhibit behaviours central to hope, such as goal-oriented actions and problem-focused strategies (Scheier & Carver, 1985; Solberg, 2016). These distinctions were primary drivers for interpreting factor one as measuring a pessimistic view of threatening world events, and factor two as simply measuring negative affect in relation to threatening world events.

On the other hand, POTWEQ-Coping had positive relationships with hope, eustress and psychological well-being. These positive psychological constructs, which have also been named coping resources, are associated with proactive and goal-directed behaviours, problem-focused coping, perceiving stressors in a positive light, adaptability to stress, and better psychological adjustment (Besser & Ziegler-Hill, 2014; Branson et al., 2019b; Chang & DeSimone, 2001; Kern et al., 2016; Lazarus & Folkman, 1984; O'Sullivan, 2011; Snyder, 2002). This subscale is also positively related to the raw variable's optimism (0.60), perseverance ($r = 0.46$), happiness ($r = 0.39$) and engagement ($r = 0.37$). Likewise, the items in POTWEQ-Coping allude to making proactive lifestyle changes, feeling determined to do so, and having positive attitudes about the future. These associations were meaningful in distinguishing this subscale as reflecting coping with threatening world events. Despite insufficient reliability and validity of POTWEQ-Coping, this subscale appears to be measuring adaptive behaviours and well-being in relation to adverse world events.

4.3 Perceptions of Threatening World Events and Psychological Associations

This study provides insight into the psychological factors that are associated with one's perception of adverse world events. Research aim #2 was to explore the relationships between students' perceptions of threatening world events, and their psychological ill-being, psychological well-being, stress response, and hope levels. Consistent with past research (Agho et al., 2010; Biddle et al., 2020; Stevens et al., 2009a), we found that individuals higher on psychological ill-being and distress were more likely to have worse perceptions of

adverse world events. Specifically, they have a more pessimistic view about things going *right* in the world and are more likely to believe that threatening world events will worsen in the future, as compared to their mentally healthy counterparts. Students with greater ill-being and distress are also prone to feeling anxious about the threat of adverse world events and hold high levels of concern that they, their family or friends could personally be affected. As Lowenstein et al. (2001) proposed, this relationship could be a consequence of the negative associations individuals with greater ill-being make. For example, people experiencing psychological distress tend to be more vigilant towards hazards, seek out related information, perceive threats as highly likely to occur, and make personal threat associations (Lowenstein et al., 2001). Another understanding is that adverse world events tend to arouse negative feelings, such as fear, which leads individuals to overestimate threat, and experience greater feelings of worry, anxiety and pessimism (Biddle et al., 2020; Huddy et al., 2003; Johnson & Tversky, 1983).

Conversely, positive psychological constructs appear to be protective factors in dealing with threatening world events. We found that students with higher levels of psychological well-being, hope and eustress were coping better with the threat of adverse world events. Specifically, it appears that these individuals are more motivated to make positive behavioural changes and they have a less pessimistic view of the future. Lazarus and Folkman's (1984) Cognitive Theory of Stress posits a bidirectional relationship between high perceived control and low threat perception. According to this theory, we speculate that problem-focused coping (i.e. in the form of behaviour change) may allow an individual to view the threat of adverse world events as manageable and perceive threat in a more positive light, and vice versa. As we have mentioned, well-being, hope and eustress are associated with positive appraisals. Of psychological well-being, optimism in particular is strongly related to positive expectancies for the future (Feldman & Kubota, 2015; Rand et al., 2011).

In line with scholars' past suggestions (Besser & Ziegler-Hill, 2014; Cohen-Chen et al., 2015; O'Sullivan, 2011; Snyder et al., 2002), individuals who have better psychological health may make positive associations such as: "I can deal with the threat", "it is temporary", and "it can change for the better in the future". Interestingly, psychological well-being did not predict less negative affect about threatening world events. This indicates that individuals who have better psychological health do not necessarily elude feelings of worry or panic, they merely respond to it in a proactive fashion, leading to better adaptation, lower threat perception and resilience in the face of fear.

4.4 The Link between Intelligence, Well-Being and Threat Perception

One reason why we deemed threatening world events to be relevant to University students is because past literature has demonstrated that formal educational qualifications were related to greater threat perceptions (Agho et al., 2010; Biddle, 2020; Huddy et al., 2003; Reser et al., 2012). We proposed that this may be due to the information young educated people seek out, the discourse they are involved in with their peers, and their prevalent activity on media networks. Nevertheless, something we did not expect to see is that more intelligent students had lower levels of psychological well-being and hope, and likewise, were not coping as well with threatening world events. This indicates that more intelligent students are less optimistic in general, leading to greater threat perception and a more pessimistic view of threatening world events. The positive relationship we found between intellectual ability and POTWEQ-Pessimism supports this, despite the correlation not reaching statistical significance. Moreover, it appears that more intelligent students are less likely to engage in goal-directed and proactive behaviours to cope with threatening world events. Perhaps this is a consequence of students perceiving their intelligence to be compensatory. It is evident that University students are not only perceiving greater threat due to social and environmental factors, they also seem to be driven by where their intelligence

steers them. Intelligent students may look deeper into the complexities of a situation, causing them to worry more and increase perceived threat. Given that entry into University is based on intellectual performance, we speculate that many students would be needing support to increase and maintain their well-being levels. It would be beneficial to further explore the mechanisms behind intelligent students' lower well-being, and investigate potential indirect relationships between intellectual ability, psychological well-being, threat perception and academic outcomes.

4.5 Proximity of Stressors

Another surprising finding in this study is that the proximity of a stressor appears to be influencing how it is experienced. For example, our measure of psychological ill-being is related to how frequently an individual *personally* experiences symptoms of mental ill-health (Lovibond & Lovibond, 1995). Similarly, our measure of distress is related to one's *personal* stress response to their educational requirements (Branson et al., 2019a). Conversely, our measure of perceptions of threatening world events is related to how individuals perceive events that they may or may not be at risk of, and that they may or may not have been directly affected by. In this research, a strong relationship has emerged between psychological ill-being and distress. Yet, when looking at the relationship between ill-being and distress with POTWEQ- Pessimism and Affect, we see that the relationships are weaker. This suggests that the proximity of a stressor moderates how severely it impacts an individual. This is in line with Huddy et al.'s (2003) finding that physical proximity to a threatening world event was associated with greater fear, anxiety and perceptions of personal threat. Researchers also suggest that emotional proximity, such as having a loved one who was personally affected, also leads to greater negative outcomes (Huddy et al., 2003). For some people in our sample, threatening world events may appear to be a distant reality. The University of Adelaide, where the sample for this study was recruited, is in a geographical

location that has been relatively unaffected by direct instances of adverse world events. Perhaps in other Australian states, such as New South Wales and Victoria where threatening world events have been more of a direct reality, threat perceptions would be greater. Unfortunately, we did not consider physical or emotional proximity in this study, therefore, we have no way of knowing whether some students were more or less impacted by this factor.

4.6 Predictors of Academic Performance

Research aim #3 was to test the relationship between psychological ill-being, psychological well-being, stress response, hope and academic performance, while controlling for well-established predictors of academic achievement. In contrast to past literature (Akgun & Ciarrochi, 2010; Chang, 1998; Cheung et al., 2020; Chua et al., 2018; Fontaine et al., 1993), psychological ill-being, well-being, distress, eustress, and trait hope did not predict academic performance. Although it is promising to see that psychological ill-being and distress are not meaningfully affecting student grades, it would be wise to question this notion as the positive psychological factors seem to be having no effect as well. The non-significant relationships may reflect variables that we have missed in this study which could be important in mediated relationships. For example, Feldman and Kubota (2015) have found that hope gives rise to academic self-efficacy and academic-specific hope, which in turn, gives rise to academic achievement. In line with this, researchers have suggested using academic-specific measures, rather than general measures alone (Feldman & Kubota, 2015). Another reason why we may not be seeing meaningful relationships with expected variables is because the sample size of this study was quite small. We found that psychological ill-being had somewhat of a weak relationship with academic grades, though it was not significant. Perhaps a larger sample size would bring more clarity to this relationship and others, like distress and eustress. Moreover, if psychological ill-being and distress are found

to be significantly related to academic performance, it would be interesting to explore a mediated relationship between threat perception, psychological ill-being and academic outcomes.

As expected, we found that more intelligent and conscientious students were performing better in their academic semester, with intelligence being the stronger predictor. Consistent with past literature (Busato et al., 2000; De Feyter et al., 2012; O'Connor & Paunonen, 2007), conscientiousness accounted for variance in academic performance beyond that of intellectual ability. Albeit, the additional variance accounted for was small. Interestingly, with the addition of other psychological variables in step 2 of our regression analyses, conscientiousness was no longer providing meaningful variance. We propose that this could be an issue of multicollinearity. Correlation analysis indicated that conscientiousness was positively correlated with psychological well-being, eustress and hope, and negatively with ill-being and distress. This suggests that these variables are providing common outcomes, thus, we cannot distinguish their unique contribution. Most obviously, conscientiousness has similarities with psychological well-being, hope and eustress, in that they all have elements of goal-orientation, persistence, productivity, and motivation (Chamorro-Premuzic & Furnham, 2003; Kern et al., 2016; O'Sullivan, 2011; Snyder, 2002).

4.7 Limitations and Considerations

As we have briefly mentioned, a main limitation of this study is the small sample size ($N = 108$). Due to this factor, we cannot confidently generalise the results of this research to other University students across Australia. Sample size has also influenced the inadequate level of power for the study, and again, we suggest that the results of this research be interpreted with caution. We understand that to achieve a power level of at least 80%, an accepted effect size of 0.30, and an accepted alpha of < 0.01, a sample size of 125 participants is necessary. As a minimum, we propose this for future research. Another

limitation of the study is that the construct validity of the POTWEQ is inconclusive. This is due to EFA fit indices suggesting poor model fit. Again, we postulate that this is a consequence of our small sample size and presume that a larger participant pool in the future will be able to provide further clarity to the validity of the POTWEQ.

The POTWEQ-Coping subscale does not have good internal reliability; thus, we cannot concretely define what this scale is measuring. We propose that refinements be made in the future. Specifically, we suggest that the item with the lowest factor loading ('I feel satisfied with how I deal with the fear of threatening world events') be removed and replaced. An item that considers one's coping behaviours, rather than how they feel about their coping behaviours, would be better suited. Further, it may be beneficial to include another item relating to having a positive outlook on the future, or reappraising threatening world events in a positive light. High factor loadings will provide further evidence that this subscale is measuring coping with threatening world events.

Lastly, we did not consider whether participants had been directly, indirectly or psychosocially impacted by threatening world events. Thus, this factor may have served as an extraneous variable. More importantly, information about proximity would have been helpful to inform whether particular groups of students required more support than others. This limitation can be overcome with related demographic questions.

4.8 Strengths and Implications for Future Research

This research provides a valuable contribution to the literature regarding threat perceptions and academic performance for multiple reasons. Firstly, we have developed a new scale with good preliminary psychometric properties for measuring perceptions of threatening world events. There is an opportunity for future research to continue developing and refining the POTWEQ according to DeVellis (2016) principles. Subsequent studies

should consider other forms of reliability and validity, and possibly creating a composite POTWEQ score.

Secondly, this study looks at threat perception from a different perspective and adds to the scales that researchers have utilised in the past. Threat perception has traditionally been measured in terms of the level of risk people perceive. We have retained this conceptualisation in our scale, but have also included the negative affect individuals may experience, and how they cope with perceived threat.

This research contributes knowledge about perceptions of threatening world events in a demographic that has been relatively overlooked. We add to what is already known about psychological distress having a negative influence on threat perception, and vice versa. In addition, we inform what some of the protective factors are that allow students to cope effectively with threat. We propose that positive psychological factors continue to be considered in threat perception research. As Seligman and Csikszentmihalyi (2000) have said, flourishing is not merely the absence of mental illness.

Finally, we explore threat perception in a way that it hasn't been before, and that is alongside academic performance. We note the relationships that would be worth exploring further. Specifically, it would be valuable to gain a deeper understanding about intelligent students' low well-being, and explore potential indirect relationships between intellectual ability, psychological well-being, threat perception and academic outcomes. Similarly, it would be beneficial to explore a mediated relationship between threat perception, psychological ill-being, and academic outcomes. This research may provide a more well-rounded picture of how perceptions of threatening world events are influencing students' academic performance.

4.9 Conclusion

The findings in this research clearly indicate that threat perception and psychological health are associated factors. We have noted the maladaptive mental states that increase a person's pessimism and negative affect in relation to adverse world events, and the positive psychological constructs that help individuals cope with threat. Although we did not see meaningful relationships between academic performance and most of our predictor variables, we have offered considerations and suggestions for future research. We encourage and anticipate that the newly developed scale for measuring perceptions of threatening world events will continue to be refined and evaluated. More importantly, we hope that this study has provided the groundwork for deeper exploration of student outcomes in response to adverse world events. With threatening world events becoming a more frequent and severe reality, it is vital that we learn how best to support students through times of adversity so that they can continue thriving in their education and everyday life.

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Appendix A

Perception of Threatening World Events Questionnaire

Scores are computed as the sum of the corresponding items for each subscale. First, reverse score: Q10, Q11,

POTWEQ-Pessimism = Sum(Q1, Q10, Q11, Q12, Q13, Q14)

POTWEQ-Affect = Sum(Q2, Q5, Q6, Q8)

POTWEQ-Coping = Sum(Q3, Q4, Q7, Q9)

This questionnaire aims to measure your personal perception of threatening world events. 'Threatening world events' refers to serious incidents which have the potential to occur globally. They may pose a risk to human life and the earth's natural environment. Consider terrorism, climate change related disasters, and pandemics. In the last few years, Australia has seen acts of terrorism in its big cities, bushfires which have called for a state of emergency, and most recently, the COVID-19 outbreak which is changing the way that we currently live. Threatening world events are relevant to us all by direct or indirect means.

For each question, please circle the answer you most agree with.

1) How likely do you think it is that threatening world events will worsen in the future?

1) Not at all likely

2) A little likely

3) Moderately likely

4) Very likely

5) Extremely likely

2) How concerned are you that you, your family and/or friends could be directly affected by threatening world events?

1) Not at all

2) A little

3) Moderately concerned

4) Very concerned

5) Extremely concerned

For each statement, please mark the answer you most agree with.

3) I feel motivated to make a positive change when considering threatening world events.

1) Not like me

2) A little like me

3) Moderately like me

4) Very much like me

5) Extremely like me

4) I feel satisfied with how I deal with the fear of threatening world events.

1) Not like me

2) A little like me

3) Moderately like me

4) Very much like me

5) Extremely like me

5) I feel panicked when I think about threatening world events.

1) Not like me

2) A little like me

3) Moderately like me

4) Very much like me

5) Extremely like me

6) I feel overwhelmed when I think about threatening world events.

1) Not like me
2) A little like me
3) Moderately like me
4) Very much like me
5) Extremely like me

7) I feel determined to make a positive difference when considering threatening world events.

1) Not like me
2) A little like me
3) Moderately like me
4) Very much like me
5) Extremely like me

8) I feel anxious when I think about threatening world events.

1) Not like me
2) A little like me
3) Moderately like me
4) Very much like me
5) Extremely like me

9) I know everything will be okay even in the worst of times.

1) Not like me
2) A little like me
3) Moderately like me
4) Very much like me
5) Extremely like me

10) The future looks bright despite threatening world events.

1) Not like me

2) A little like me

3) Moderately like me

4) Very much like me

5) Extremely like me

11) I anticipate more good than bad to come in the world.

1) Not like me

2) A little like me

3) Moderately like me

4) Very much like me

5) Extremely like me

12) I believe things do not ever seem to be going right in the world.

1) Not like me

2) A little like me

3) Moderately like me

4) Very much like me

5) Extremely like me

13) I believe things do not ever seem to be going the way they should in the world.

1) Not like me

2) A little like me

3) Moderately like me

4) Very much like me

5) Extremely like me

14) I do not expect good things to come in the world.

1) Not like me

2) A little like me

3) Moderately like me

4) Very much like me

5) Extremely like me