DOCTORAL THESIS

Redefining Resilience During Emerging Adulthood: Evaluation of a Population Specific Mindfulness-Based Model and Intervention.

Souter, Breeana

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Redefining Resilience During Emerging Adulthood: Evaluation of a Population Specific Mindfulness-Based Model and Intervention

Breeana Kristin Souter

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Associate Professor Dr Peta Stapleton and Assistant Professor Dr Douglas Angus

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Abstract

A growing body of international research suggests emerging adulthood (i.e., 18 to 29 years of age) presents a period of vulnerability to stress, psychological distress, poor university adjustment, academic failure, substance abuse and even significant psychopathology. Consequently, optimising the resilience, mental health, and well-being of emerging adults (EAs) during transition to university has been identified as a global priority. There is also evidence to suggest EAs in high demand programs such as medicine are at elevated risk for stress-related impacts, including higher psychological distress and psychopathology, chronic stress and burnout compared to the general EA university population. Within Australia, an urgent call has been made for researchers to better understand the issues of EA and enhance the capacity of university and mental health sectors to effectively respond to the needs of this group. Researchers and institutions argue that effective, preventative and developmentally appropriate supports and interventions aimed at building resilience are needed; however, there is mixed evidence on factors underpinning resilience and well-being in this population. Additionally, a lack of evidence-based interventions currently exists. Consequently, further investigation of evidence-based well-being frameworks and effective preventative support interventions for this population is required.

Mindfulness meditation training has been identified as an effective practice for reducing stress and psychological distress in young people. However, limited mindfulness-based models have been evaluated with EA university students. There are also limited application of such models to specific developmental stages, considering the unique neurological and systemic processes crucial to this life stage. This appears critical in providing interventions designed to target resilience and well-being for young people during change and adversity. The overarching aim of this thesis was to enhance the understanding of psychological well-being during EA, re-conceptualise the definition of resilience in this population, and evaluate an evidence-based framework and intervention for enhancing resilience and psychological well-being via mindfulness meditation training in this population.

A mixed methodological approach was used with three sequential studies conducted. To address the limitations of current definitions of resilience for the EA population, the current thesis proposes the new definition *Eudaimonic Integration (EI)*. EI contends the process of fostering adaptive self-regulation, meaning making and wisdom during and following adversity involves integrated neurobiology and balanced, adaptive components of mind and body considered within the context of relational systems. To investigate the similarities and differences in resilience among EA university students from different regions, Study 1 investigated stress perceptions, psychological distress and satisfaction with the university

experience among EA university students from Australia, Hong Kong and USA (N = 221). These regions were chosen to explore similarities and difference among EAs studying in these locations. Study 1 highlighted the importance of resilience in reducing perceptions of stress and psychological distress across these regions, as well as the differences in mental health and resilience among students studying in these regions. Therefore, Study 2 aimed to provide a more comprehensive understanding of components comprising EA resilience and EI relevant to cultural context. Study 2 aimed to develop and evaluate a new theoretical model of resilience and psychological well-being for an EA university population from Australia, the Model of Eudaimonic Integration (MEI). The MEI proposed an integrated systems view of how mindfulness promotes resilience, fostering response flexibility, positive emotion and self-compassion as foundations for personal beneficial meaning making of life events and challenges (i.e., positive reappraisal). The model was not intended to be linear in process, but rather describes a comprehensive and interwoven relationship between facets which over time operate in conjunction to foster expanding levels of embodied resilience and psychosomatic processing of present moment experience within the individual, impacting the inter-connected systems which surround them.

The MEI was initially evaluated with EA students across all disciplines, to provide a guiding framework for the development of a pilot mindfulness-based intervention (MBI) in culturally specific settings (i.e., Australian EA students; N = 420). Results showed support for MEI as a model predicting higher resilience and lower perceived stress and psychological distress in this population. To further understand the application and efficacy of the MEI, Study 3 used the MEI as a guiding framework for the development and evaluation of a pilot six-session MBI the Mindful Awareness Resilience Skills Training Program (MARST-P) via a Randomised Control Trial (RCT). The MARST-P was developed specifically for an EA medical student population from Australia (N = 52). EA medical students were chosen to evaluate the efficacy of the MEI and MARST-P with an at-risk population of EAs to the development of chronic stress and psychological distress.

Study 1 showed EA university students with higher resilience experienced lower levels of psychological distress and perceived stress, and higher satisfaction with academic experience. Significant relationships between perceived stress and psychological distress were partially mediated by resilience. Differences in mental health were reported among students from different regions, with participants from Australia generally reporting significantly lower psychological distress and lower perceived stress. This highlighted the importance of understanding the unique developmental and cultural contexts relevant to EA populations. Study 2 provided evidence for the MEI as an effective resiliency model for reducing stress and

psychological distress, and promoting positive re-appraisal, psychological well-being and resilience in Australian EA university students from all disciplines. Higher mindfulness was a significant predictor of all aspects of the model; higher psychological flexibility, self-compassion, positive emotions and positive re-appraisal. These results provided evidence for higher levels of mindfulness as a predictor of all mechanisms proposed within the MEI, suggesting the MEI provides an effective framework to guide and inform MBIs with this population. Study 3 showed support for the effectiveness of pilot MARST-P with an at-risk population of EA medical students in targeting all factors identified within the MEI. Compared to the Waitlist-Control Group, the Intervention Group reported significantly higher mindfulness, psychological flexibility, self-compassion, positive re-appraisal, and resilience scores post-intervention. Results were maintained at one-month follow-up, with positive emotions also significantly higher in the Intervention Group.

Overall, this thesis highlights the importance of enhancing resilience in EA university students via mindfulness meditation training and provides support for the MEI as a framework for both understanding and promoting resilience and psychological well-being. This thesis provides preliminary evidence for the MARST-P as an effective intervention with EA medical students. Whilst further research is recommended to evaluate the efficacy of the MEI and the MARST-P in additional EA samples and cultural contexts, this thesis provides preliminary evidence for the efficacy of these aspects and highlights the need for researchers, policy makers and institutions to better consider the unique vulnerability and growth potential of this developmental stage. This thesis offers a novel systemic perspective on resilience. Ongoing research is vital, to ensure EA's receive greater awareness, understanding and access to evidence based MBI programs which promote successful transition through this developmental life stage, moving them towards self-differentiation and into well-adjusted adulthood.
Keywords: , emerging adulthood, university, model of eudaimonic integration, eudaimonic integration, resilience, psychological distress, mindfulness, self-compassion, positive re-appraisal

Declaration by Author

This thesis is submitted to Bond University in fulfillment of the requirements for the degree of Doctor of Philosophy (PhD). This thesis represents my own original work toward this research degree and contains no material which has been previously submitted for a degree or diploma at this University or any other institution, except where due acknowledgement is made. All raw data and analyses have been retained and are available upon request. I certify that I have made and retained a copy of this document.

Breeana Kristin Souter
22nd February 2022

Declaration of Author Contributions

Research Outputs

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Ethics Declaration

The research associated with this thesis received ethics approval from the Bond University Human Research Ethics Committee. Ethics application numbers #1794 (Study 1), #1919 (Study 2) and 1920 (Study 3). All procedures performed in studies involving human participants were conducted in accordance with the ethical standards of BUHREC. Informed consent was obtained from all individual participants included in each respective study; this included consent for publication.

Copyright Declaration

No published manuscripts were included for publication within this thesis.

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Acceptance and Commitment Therapy	ACT
Autonomic Nervous System	ANS
Bond University Human Research Ethics Committee	BUHREC
Depression, Anxiety, Stress Scale – 21 Item	DASS-21
Cognitive Behaviour Therapy	CBT
Cognitive Emotion Regulation Questionnaire	CERQ
Compassion Focused Therapy	CFT
Dialectical Behaviour Therapy	DBT
Emerging Adults	EA
Eudaimonic Integration	EI
Five Facet Mindfulness Questionnaire	FFMQ
Loving-Kindness Meditation	LKM
Multivariate Analysis of Variance	MANOVA
Mindful Awareness Resilience Skills Training Program	MARST-P
Mindfulness Based Cognitive Therapy	MBCT
Mindfulness Based Intervention	MBI
Mindfulness Based Stress Reduction	MBSR
Model Of Eudaimonic Integration	MEI
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Pre-Frontal Cortex	PFC
Perceived Stress Scale	PSS
Randomised Control Trial	RCT
Resilience Scale	RS
Satisfaction with Academic Experience Scale	SAES
Self-Compassion Scale	SCS
Structural Equation Modelling	SEM

CHAPTER ONE
INTRODUCTION AND RESEARCH OVERVIEW

Although emerging adulthood, the period of life ranging from 18 to 29 years of age (Arnett, 2000), is perceived as an exciting and unique time of life, there is growing concerns internationally regarding the mental health and wellbeing of this population (Aktekin et al., 2001; Dryrbye et al., 2006; McConville et al., 2017; Rogers et al., 2012). Emerging adults (EA's) in this developmental stage are no longer adolescents and have not yet moved into adulthood. Emerging adulthood is a developmental phase of change, where young people are beginning to struggle with important life choices and uncertainty. This uncertainty is related to multiple life domains such as careers, partners, identify and success (Rogers et al., 2012).

In comparison to their non-studying counterparts, those EA's attending university are at elevated risk for the development of psychological distress as a result of additional stressors and uncertainty unique to this experience (Byrd & McKinney, 2012; Dennhardt & Murphy, 2013). The transition to university reflects a period of change to multiple life domains including personal responsibilities, social supports and institutional environments (Astin & Astin, 2015; Dvorakova et al., 2018).

Around the world, universities and institutions are reporting increasing and widespread levels of psychological distress, poor university adjustment, academic failure, substance abuse and even significant psychopathology in EAs within the general university population (Byrd & McKinney, 2012; Dennhardt & Murphy, 2013; Dvorakova et al., 2018). As a result, many young people struggle to successfully complete their degrees and many withdraw altogether (Dvorakova et al., 2018). There is also evidence to suggest EAs engaged in high demand programs such as medicine are also considered to be at elevated risk for stress-related impacts, including higher psychological distress and psychopathology, chronic stress and burnout, compared to the general EA university population (Aktekin et al., 2001; Dryrbye et al., 2006; McConville et al., 2017).

Specifically, within Australian university settings there has been an urgent call for researchers to better understand the issues of young people; to support the capacity for both the university and mental health sectors in effectively responding to the needs of this group (The National Centre of Excellence in Youth Mental Health, 2017). Australian Census data from 2015 indicates approximately 1.4 million students are engaged in university education, with approximately three in five students aged between 15 and 24 years. Approximately 25% of these young people will experience stress and psychological distress in any year enrolled,

with associated risks for decreased satisfaction with the university experience, increased attrition rates, and impacts on future mental health, education and employment pathways (The National Centre of Excellence in Youth Mental Health, 2017). Similar concerns and outcomes are being reported for this population around the world (e.g., Auerbach et al. 2016; Centre for Collegiate Mental Health, 2016; Eisenberg et al., 2013; Lo et al., 2020).

The process of attending university is a rite of passage; entering university and the transition from home is associated with separation from family and friends, increased independence and the ability to self-regulate and integrate into new social and academic environments (Dvorakova et al., 2018). Transition points such as attending university present predictable periods of time associated with increased change, uncertainty and vulnerability to stress and psychological distress across the lifespan (Carter & McGoldrick, 1999). Carter and McGoldrick describe The Family Life Cycle, which incorporates specific stages of transition for individuals (and their family unit). These transition points present as both times of vulnerability to stress, as well as opportune times for building stress-resilience (Brown, 2012). The first life-cycle transition is the "Launching of the Single Young Adult," coinciding with EA and university attendance.

It is evident that considerable adaptive coping resources and resilience skills are needed to navigate this life cycle transition effectively for young people attending university, as well as successfully addressing the developmental stage relevant tasks related to young people's professional, social and inner lives (Roeser, 2012). However, there are increasing reports indicating that many young university students lack coping resources and resilience skills necessary to navigate this normative transition on the path to adulthood (Acharya et al., 2018; Cleary et al., 2011; Dvorakova et al., 2018).

Universities have a key institutional opportunity to positively impact on young people's lives, however clear research gaps remain regarding how these settings can best equip students with resiliency skills and shape their well-being, academic progress and successful resolution of key developmental tasks (Byrd & McKinney, 2012). Government and educators are turning to researchers for a deeper understanding of this developmental phase as well as health promotion interventions designed to decrease stress and promote resilience in this population (Delany et al., 2015; Regehr et al., 2013; Shiralkar et al., 2013).

Whilst the importance of student perceptions of stress and response capacity to challenging situations, including self-regulation, effective coping and resilience have been identified as crucial (Delany et al., 2015; McConville et al., 2017; Regehr et al., 2013), there

are limited evidence-based models providing a framework for effective interventions to reduce psychological distress and build resilience in EA university students. More specifically, significant research gaps have been identified regarding appropriate frameworks, resources and policy to address increasing rates of stress and mental ill health in young Australian university students.

Over the last 20 years, mindfulness has become a cultural movement in Western societies that includes the introduction of a variety of mindfulness practices and mindfulness-based interventions (MBIs) into education (both K-12 and university education), showing varied efficacy for improving well-being (de Carvalho et al., 2017; Sibinga et al., 2016; Weare, 2013). Evidence that supports the use of MBIs to promote health outcomes among university students is still unfolding, with numerous delivery modes and durations implemented (Dawson et al., 2020). Overall, systematic reviews show that when comparing course based MBIs to passive controls, MBIs significantly reduce levels of distress, depression, anxiety, rumination and increase well-being within university students post intervention, with long term reductions in distress also found (Dawson et al., 2020).

Despite these outcomes, approximately 14 universities have implemented MBIs into curriculums for students considered at elevated risk, such as medical students. Within Australian university settings, there is currently one university in Victoria (Monash University) offering MBIs to students as part of their curriculum, demonstrating positive outcomes for reducing psychological distress. Validated MBIs remain limited, and vary in format, duration and outcomes. Whilst research specifically examining this population is growing, there remains limited validated models providing a framework for MBIs to successfully target psychological well-being and resilience (Dawson et al., 2020). The current body of research aimed to address these gaps.

The mind-body benefits of mindfulness-based practices have been an established aspect of Buddhist philosophy for over 2,500 years (Armstrong, 2001; Baer, 2003). However, the practice of mindfulness meditation has only recently been integrated into western psychology and medicine with scientific evidence demonstrating support for mindfulness meditation in enhancing numerous aspects of mental and physical development and well-being (Page, 2019). Mindfulness can be defined as awareness, cultivated by paying attention in a sustained and particular way; on purpose, in the present moment, and non-judgementally (Kabat-Zinn, 1990).

Generally, consensus remains limited regarding facets and mechanisms via which mindfulness promotes resilience and psychological well-being in EA university students. This chapter will review in detail relevant and effective theories and mechanisms for the promotion of resilience and psychological well-being in EAs as a result of mindfulness meditation. This will include a review of theories such as Mindsight and Integration (Seigel, 2010) and Mindfulness to Meaning Theory (Garland et al., 2015) as well as the role of mindfulness meditation in promoting psychological flexibility (Bishop et al., 2004; Hayes et al., 2006), self-compassion (Dvorakova et al., 2018; Neff, 2003), positive emotions (Dispenza, 2014, Garland et al., 2010), and positive re-appraisal – the capacity to make meaning of life events as benign or positive (Garland et al., 2015).

There is also limited consensus on what comprises resilience and growth within this population. To address this gap the current research has proposed a new term, Eudaimonic Integration (EI) as a more comprehensive definition and understanding of resilience with EA university students. EI describes the process of fostering adaptive self-regulation, meaning making and self-compassion during this developmental stage with an emphasis on fostering interpersonal neurobiology (Seigel, 2012). Integrated neurobiology is described by Seigel (2012) as cultivating balanced, adaptive components of mind and body considered within the context of relational systems.

Eudaimonia, in Aristotelian ethics, is defined as the condition of human flourishing or of living well (Miller, 2010). The conventional English translation of the ancient Greek term, "happiness," is unfortunate because eudaimonia, as Aristotle and most other ancient philosophers understood it, does not consist of a state of mind or a feeling of pleasure or contentment, as "happiness" (as it is commonly used) implies (Miller, 2010). For Aristotle, eudaimonia was considered the highest human good, the only human good that is desirable for its own sake (as an end in itself) rather than for the sake of something else (as a means toward some other end; Miller, 2010).

This research also proposed a new model for understanding resilience and psychological well-being in EA university students, the Model of Eudaimonic Integration (MEI). The MEI is a longitudinal process model of mindful emotion regulation and quality and integration of relational systems (with self, others and world), promoting response flexibility, positive emotions and self-regulation and compassion as a foundation for beneficial meaning making of life events and challenges, which in turn fosters resilience, growth and personal potential across the lifespan. Depending on the application of the model to a specific population, the

unique developmental tasks and impending/current life-cycle transition are also considered to provide guidance around the nature and context of specific stressors to inform the development of appropriate intervention. These new concepts will be discussed briefly at the end of this chapter, and in detail in chapters 3 and 4.

The current Chapter outlines developmental considerations and issues relating to EA university and medical students. The impacts of stress and The Appraisal and Coping Model During Transition to University and relevance of the Family Life Cycle is also summarised. Resilience is defined and mindfulness meditation introduced. Relevant mindfulness theories and mechanisms for mind-body wellbeing are explored. MBIs are reviewed with research gaps highlighted. Research questions are discussed, and a thesis overview provided. Finally, a brief overview of the newly developed EI and MEI is proposed.

Emerging Adulthood: A Unique Developmental Stage

Traditional developmental theories considered adulthood to commence following the end of adolescence. Adolescence commences with the onset of physiologically normal puberty, ending when adult identity and behaviour occurs. This transitional period was first identified by Erikson's Psychosocial Theory of Development (Erikson, 1968), marked by unique developmental tasks and processes. Whilst adolescence corresponds to the approximate ages of 10 to 19 years, the World Health Organization's (WHO) definition of adolescence also falls within their broader definition of young people (considered between the ages of 10 and 24 years). Contemporary researchers suggest this broad age range proposed to define adolescence and young people may not accurately reflect the distinct neurological, psychological, behavioural, and systemic changes occurring during this phase of life (Arnett et al., 2014). Accurate understanding of the unique life stages precipitating adulthood is essential in determining the unique challenges, tasks and goals of this stage and therefore enhancing understanding and appropriate supports and interventions.

Emerging adulthood is a new life stage between adolescence and adulthood and describes the developmental period spanning the ages of 18 to 29 years of age (Arnett, 2000; 2003). Arnett (2000; 2003; 2006) described emerging adulthood as the transitional period from the end of secondary school through to the successful attainment of adult status. Arnett (2004) proposed this new developmental stage to capture the unique transitional period in human development that occurs between late adolescence and young adulthood in cultural contexts, where marriage and parenthood are now delayed until the late twenties or beyond. According to Arnett, EA is a "time of exploration and instability, a self-focused age, and an age of

possibilities" (p. 21).

EA was proposed as a unique phase following results of an international study of 300 young people aged 18-29, which demonstrated distinct differences in developmental tasks between adolescents and EAs (Arnett, 2006). Whilst adolescence is associated with increased novelty seeking, social engagement, increased emotional intensity and creative exploration; EAs display five distinctive developmental features including, 1) identity explorations, 2) instability, 3) self-focus, 4) feeling "in-between" adolescence and adulthood, and 5) a sense of broad possibilities for the future (Arnett et al., 2014). During EA, young people are often engaged in developmental tasks such as identity exploration and self-focus, initiation of new roles, the development of new social networks, separation from families and existing friends, increased choices and opportunities, increased independence, freedom from time constrains and social control and decreased parental support, guidance, and monitoring (Cabrera, 2019).

EA occurs primarily within developed regions, where there is a higher prevalence of university attendance and a higher median age of transition points such as marriage and childbearing (i.e., 30 years and over; Arnett, 2006; Arnett et al., 2014). However, there are variations in EA within developed regions around the world. For example, the duration of EA is the longest in western regions such as Europe and USA. Within developed Asian regions, the self-focused freedom of EA occurs in conjunction with ongoing obligations and commitments to parents and family as well as conservative views of aspects associated with identity exploration such as sexuality (Arnett, 2006; Arnett et al., 2014). Arnett (2006) suggests that although present primarily in developed regions, the increase of globalisation results in the increasing relevance and prevalence of EA around the world.

EA naturally comes with increased uncertainty, as young people explore multiple aspects of themselves and the potential life paths before them. Young people begin to struggle with important life choices such as: What career is best for them? Who is the right life partner for them? What measures of success are important to them (Rogers, 2013)? Whilst the constraints of childhood have naturally ended, these young people have not yet moved into a stage of life where adult responsibilities (e.g., family and career) provide boundaries and limits (Rogers et al., 2013). Multiple pathways and options can contribute to EAs' sense of uncertainty and at times overwhelm. Many young people have received the messages from parents and teachers that they can "do anything," which can be interpreted unhelpfully as "you should do everything," resulting in both fear of trying as well as trying and failing (Rogers et al., 2013).

Thus, a percentage of young people transitioning into this phase of life bring with them an obligation to succeed, whilst lacking the inner skills and resources needed to successfully manage competing pressures, demands and stressors and make wise and authentic decisions for themselves (McConville et al., 2017). As a result, young people transitioning to university are struggling to balance the freedom of choice with expectations of success and fear of failure (Rogers & Maytan, 2019). Whilst not all EAs are engaged in university, an increasing percentage are. According to the National Centre for Education Statistics, university enrolment in the USA for 18- to 24-year-olds increased from 35% in 2000 to 41% in 2018. Regions such as Australia also demonstrate increased university attendance for young people, with data from 2016 indicating approximately 1.4 million students are engaged in university education. Overall, 26% were international students; 1.1 % self-identified as Aboriginal and Torres Strait Islander (a 7.1% increase on the 2014 participation rate); 19.2% were students in regional areas; and 16.5% were people from low socioeconomic backgrounds (Department of Education, 2016). ABS census data from 2013 indicated that most higher education students began their studies directly, or soon after, secondary school, with around three in five aged between 15 and 24 years (Australian Bureau of Statistics, 2013). Within the current university student population this would equate to at least 840,000 students in this age group (i.e., within the developmental stage of EA). In developed Asian regions, such as Hong Kong, approximately 32.7% of young people were engaged in higher education (Hong Kong Special Administrative Region, 2016).

Issues and Challenges for Emerging Adult University Students

EA presents a developmentally vulnerable period for the development of stress and psychological disorders. According to a review of epidemiological studies internationally, the 12-month prevalence of any psychiatric disorder is more than 40% in people aged 18–29 years; higher than in people in any other age ranges and especially noted for anxiety disorders, mood disorders, and substance misuse (Arnett et al., 2014). Similarly, Arnett et al., (2006) showed anxiety and mood disorders were the most prevalent psychiatric disorders in people aged 20–34 years, with the prevalence of these disorders in young people being higher in the previous 12 months than in those aged 35 years and older.

Whilst many EAs attending university show healthy coping and adjustment, many also experience significant stress and psychological distress during this time. Stressors experienced by EA university students are often unique in nature and differ to those of same age peers not engaged in higher education (Stallman, 2010). Such additional and unique

stressors include 1) transition to university life, 2) acclimating to a new environment, 3) independently managing the demands of daily life, 4) establishing new university social networks, 5) meeting their personal educational goals; 6) managing study and work commitments, 7) academic overload and demands, 8) financial pressures, and 9) pressure to succeed and complete their degree (Newcomb-Anjo et al., 2017; Sidana et al., 2012). In the context of neurological development, these additional and unique stressors place EA university students in a position of elevated psychological vulnerability to both stress and distress (Verscheren et al., 2017).

Challenges in successfully navigating changes and potential stressors during this developmental stage can have significant consequences on EA's mental health and well-being. Based on surveys from 21 countries, the World Health Organization World Mental Health Surveys examined the associations of psychological disorders with university entry and attrition by comparing university students (n = 1572) and non-students in the same age range (18–22; n = 4178), including non-students who recently withdrew from university (n = 702). One-fifth (20.3%) of university students had reported an incidence of DSM-IV/ICD disorders in the last 12 months and around 83% of these cases had pre-matriculation onset, which was more important in predicting subsequent attrition when compared with those post-matriculation onsets. However, only 16.4% of students with disorders received any health care treatment for their mental disorders (Auerbach et al., 2016). A systematic review of studies of depression prevalence in university students reported prevalence rates ranged from 10% to 85% with a weighted mean prevalence of 30.6% (Ibrahim et al., 2013). The results suggested that the chances of university students suffering from depression are substantially higher as compared to non-students in the general population

Other international studies using self-report measures of psychological distress comparing EA university students with peers not engaged in university studies also generally found university students reported poorer psychological health. For example, Roberts et al. (1999) found that, except for physical functioning, all subscales of the ShortForm-36 Health Survey (SF-36) and the General Health Questionnaire indicated levels of university student health significantly below population norms matched for age and gender. Similarly, Stewart-Brown et al. (2000) showed that students had poorer health on all eight dimensions of the SF-36 compared to community peers, with the greatest difference due to emotional problems (i.e., depression, anxiety and stress). A meta-analysis conducted by Mortier et al., (2018) also found that based on currently available probability samples worldwide, approximately 25% or

1 in 4 university students have experienced some form of suicidal ideation, with almost 65% of those reporting experiencing ideation in the year prior to the assessment.

Studies have generally found that EA female university students have a higher risk of psychological distress than males, although not consistently or for all disorders (Blanco et al., 2008; Eisenberg et al., 2007; Leahy et al., 2010; Roberts et al., 2000; Stallman, 2010; Stewart Brown et al., 2000; Verger et al., 2010). In addition, Roberts et al. (1999) found that students worked on average 17.6 (SD = 11.6) hours per week outside of university and that working longer hours in paid employment was associated with poorer mental health outcomes particularly for younger students. Consistent results have been obtained for the association of financial problems with psychological distress or mental disorders in university students (Eisenberg et al., 2000; Roberts et al., 1999; Stallman, 2010; Stewart-Brown et al., 2000).

Chronic stress and psychological distress have also been associated with negative effects on university students' ability to study and their overall academic outcomes (Andrews & Wilding, 2004; Stallman, 2010; Stewart-Brown et al., 2000; Verger et al., 2010). Even students who master course content but fail to develop adequate coping skills and resilience, may be at risk of university withdrawal (Wilcoxson et al., 2011). In addition, student satisfaction with their academic experience and university are also significantly influenced by level of psychological distress (Day & Livingstone, 2003). *Satisfaction with academic experience* can be defined as the level of satisfaction students have with experiences in the classroom and the staff, and the level of preparedness the course offers for future career prospects relative to their expectations (Nora, 2004). Both mental health and well-being as well as satisfaction with the experience of university are essential elements in promoting course completion and reducing attrition rates (Day & Livingstone).

Spotlight on Emerging Adult Medical Students

In addition to transitional stressors experienced by EAs within the general university population, those engaged in medical training also experience longer work hours, ongoing significant study requirements, and need for the rapid development of clinical skills in ongoing stressful and challenging environments (McGorry, 2014). These challenges occur as the EA medical student moves through the first life cycle transition increasing risk for development of chronic, severe stress and psychological distress, including depression and suicide, anxiety, substance abuse and other pathological coping styles, compromised interpersonal relationships and support systems, ethical erosion, de-idealisation, and destabilised concepts of self and world (Rosenweig et al., 2013). These findings highlight the

critical need for researchers and institutions to better understand stress and psychological distress within this developmental phase, reducing the significant impacts of stress on this population.

The Family Life Cycle: Life's Transition Points

When considering EA as a unique developmental stage, it is imperative to examine the systemic and relational changes occurring during this time. Such changes can be both a significant source of stress, as well as adaptive and protective factors for young people (Brown, 2012). Each EA transitioning to university will be unique in the degree as to which these changes and events are experienced as stressful and possess their own unique set of inner coping resources to navigate such change. These experiences and resources will be shaped by theirs and their families' earlier experiences of stress and coping, impacting present moment responses. Systemic theories also suggest the importance of understanding somewhat "predictable" times in our lives marked by increased change and therefore the potential for vulnerability to stress.

Carter and McGoldrick (1999) proposed the concept of The Family Life Cycle which describes the concept of generations moving as a system through time, and the individual's life cycle as embedded within the broader context of the family life cycle. During such transition points in life, the entire family system must undergo a reworking of roles, membership, emotional distance, and boundaries (McGoldrick, et al., 1999). The family system is also conceptualised as having both vertical stressors (i.e., family myths, secrets, legacy and patterns passed through generations) and horizontal stressors (i.e., developmental - which are caused by the transitions of the family as it progresses through the life cycle and unpredictable – such as early death, chronic disease and accident; Dankoski, 2001). The intersection of vertical and horizontal stressors can provoke stress and anxiety, as well as a range of other negative emotions (Carter & McGoldrick).

Just as developmental periods are important to understanding unique challenges and adaptation to stress, it is also important to understand developmental tasks and changes common to various life stages. Throughout their life, an individual transitions through several predictable phases of change associated with family life cycle stages (Carter & McGoldrick, 1999; McGoldrick & Walsh, 2013). These stages are associated with increased vulnerability to stress and distress, and therefore provide important consideration for understanding how to promote resilience and adaptive coping. The stages include 1) Launching of the Single young

adult, 2) Newly Married Couple, 3) Family with Young Children, 4) Family with Adolescents, 5) Family at Midlife or Launching of Older Children, 6) Family in Later Life.

One important aspect to identify transition points according to this perspective is the entry and exists of family members mark the transition from one phase to the next (Brown, 2012). The very nature of these transitions entails the renegotiation of attachment bonds among family members. Without a secure base of attachment, and therefore the development of appropriate inner coping resources, transitions may be experienced as particularly stressful (Dankoski, 2001). The first family life cycle stage is the launching of the single young adult and is most associated with EA. This family life cycle stage is a "rite of passage" for young people leaving home and is associated with the key emotional process of transition relating to accepting emotional and economic responsibility for self (Brown, 2012). This transition is considered one of the most formative stages for resilience and maturity (Carter & McGoldrick, 1999).

Emerging Adulthood and Bowen Family Systems Theory

Bowen's theory is invaluable in understanding the unique variations in how individuals cope and move through similarly stressful circumstances, such as life cycle transitions from a systems perspective (Murdock & Gore, 2004). Bowen (1978) proposed the concept of 'differentiation of self' – which describes differing levels of maturity in relationships and has been related to important aspects of well-being including decision making, social anxiety and managing stress (Brown, 2012; Murdock & Gore, 2004). Differentiation of self is defined as the ability to think independently, whilst staying meaningfully connected to others (Brown, 2012). This emotional task is one of the key changes required for the EA to successfully navigate this life cycle (Brown).

Similar patterns of managing stress and anxiety within families and instinctive ways other species managed threat have been observed (Skowron et al., 2009). Bowen proposed personal and relational problems as stemming from exaggerated responses to sensing threat to family or other groups, forming part of the system. That is, Bowen theory focuses on understanding successful adaption across the lifespan (including during life cycle transitions), as relating to the challenges of being authentically human within our meaningful relationships (Skowron et al., 2009). This involves understanding an individual's life challenges as existing within the system around them; broadening perspective taking and understanding of stress and providing a unique path to maturing and adaptation throughout the life span (Brown, 2012; Bowen, 1978).

Enhancing stress- resilience in the EA has the capacity to promote change at all system levels surrounding the individual. It therefore appears evident that EA as a developmental stage must consider; a) the unique changes, and key and second order emotional processes of this stage, b) the unique vulnerability to stress and psychological distress during this transition, and c) the ways in which stress was managed both within the young person's family of origin and culture/societal context. Transition points, such as family life cycle transitions act to highlight an individual's mind-body stress vulnerability, defences and self-awareness, coping strategies and resilience. Essentially, these times provide insight into maturity gaps and places for mind-body healing. Young people would benefit greatly from being supported to cultivate awareness and insight into their patterns of coping with stress they bring forward with them from family of origin into this first life cycle transition as they move into EA and university life.

Understanding Stress: Psychological and Physiological Impacts

The impact of stress on emotional and physical health can be severe, with mental stress being linked to more than 23 million worldwide deaths each year (Fink, 2016; Go et al., 2004). The world Health Organisation has described "stress" as the health epidemic of the 21st Century. The experience and impacts of stress vary between individuals depending on their vulnerabilities, resilience and coping, as well as the nature of the events and tasks at hand (Fink). Whilst the impacts of stress are widely documented, stress remains difficult to define and operationalise (Fink, 2016; Frydenberg, 2002). Stress has been used alternatively to describe environmental stimuli (i.e., where stress is an agent outside the individual), as well as the response of the individual, and the interaction between the two (Sapolsky, 2004). Other definitions describe stress as a situation where environmental or internal demands (or both) exceed an individual's capacity for coping adaptively (Leahy & Dowd, 2002). Fink (2009) defines stress as the perception of threat, with resulting anxiety, discomfort, emotional tension and difficulty in adjustment (Fink, 2009).

The current research supports definitions of stress proposed by Hawkins, (2012) which describe stress as our response to a real or imaginary perceived threat to our bodily equilibrium or security (Hawkins, 2012). The current research also supports the definition proposed by Campkin (2000), where stress is described as a maladaptive state of functioning in which the sympathetic nervous system is over stimulated, resulting in pervasive psychological, physical and behavioural impacts and damage. Because individuals possess a unique set of resources, including ways of perceiving events, meaning making and

understanding the world; circumstances that appear like a threat to one person may be perceived as a challenge to another (Milner & Palmer, 2003). *Perceived stress* can be defined as the degree to which an individual perceives their life as stressful and has faith in their capacity to cope (Garland et al., 2011). A stressor can be defined as an environmental or internal stimulus requiring an adaptive coping response (Leahy & Dowd, 2002).

The experience of chronic stress has been associated with numerous adverse impacts to the mind and body across the lifespan in both clinical and non-clinical populations (Abolghasemi & Varaniyab, 2010; Rooji et al., 2010). Physical effects include epigenetic changes (Dispenza, 2014; Marsland et al., 2017), fatigue, allergies and high blood pressure, elevated cortisol hormone, inflammation, suppression of the immune system (Marsland et al., 2017; Sapolsky, 2004; Thoits, 2010), as well as cancer and gastrointestinal disorders, skin and neurological disorders, and even the common cold (Eisenberg et al., 2007; Sapolsky, 2004). Stress can impact executive functioning, especially areas of the brain regulating memory and learning (Van de Kooij et al., 2014). These impacts can result in: confusion, mental slowness, difficulty concentrating, impaired problem solving and decision making, reduced attention and logical thinking, forgetfulness, racing thoughts and general negative thinking patterns or worry (Milner & Palmer, 2003). Emotionally, individuals experiencing moderate to high stress reported feeling frustrated and irritable or tense and overexcited with a sense of being overworked and overwhelmed (Rooji et al., 2010).

The experience of chronic stress can predispose an individual to increased vulnerability to psychological distress and the development of a range of psychological disorders (Abolghasemi & Varaniyab, 2010). *Psychological distress* can be defined as a discomforting emotional state, including symptoms of depression and anxiety, experienced in response to specific stressors or demands that result in temporary or lasting harm to the individual across the lifespan (Ridner, 2004). The chronic experience of stress has been associated with anxiety and panic disorders, depression, suicidal ideation, eating disorders, post-traumatic stress disorder and substance use disorders across the lifespan (Rooji et al., 2010).

To explain these impacts, traditional psychological theories of stress have focused primarily on two aspects: appraisal and coping (Lazarus, 1993). Appraisal refers to the individual's assessment of relevance and importance of an event to their safety and well-being, whilst coping relates to the individual's resources for adaptively managing the stressor (Lazarus). Contemporary stress theories now consider the experience of stress to be

individual, environmental and relational in nature. Dispenza (2014) describes various types of stress including physical stress (e.g., trauma), chemical stress (e.g., toxins) and emotional stress (e.g., fear, anxiety, overwhelm), with different types of stress being shown to trigger more than 1400 chemical reactions and produce in excess of 30 hormones and neurotransmitters within the body (Dispenza, 2014). Through these chemical changes, the mind influences the body via the autonomic nervous system (ANS) resulting in various maladaptive epigenetic changes (Dispenza, 2014).

Moreover, many people are also experiencing a succession of triggering events and associated activation of the sympathetic nervous system (SNS). This state of functioning creates a perpetual experience of being in the "fight-flight" response and prevents mind-body homeostasis from being achieved. Continuous functioning in "survival mode" states often result in chronic stress and the associated impacts described above (Marsland et al., 2017). As previously mentioned, research has identified EA university students as an at-risk population worldwide for increasing rates of stress and psychological distress. It is therefore essential to understand relevant theories of stress relating to this population as well as the role of resilience in building adaptive cognitive coping and reducing vulnerability to psychological distress.

Appraisal and Coping Model During Transition to College

Psychological theories pertaining to stress also suggest stressors are unique to the individual and therefore cognitively mediated (Dvorakova et al., 2019; Garland et al., 2011; Leahy & Dowd, 2002). That is, because individuals possess a unique set of resources, including ways of perceiving events often shaped by past events, meaning making and understanding the world; what seems like a threat to one person may be perceived as a challenge to another (Milner & Palmer, 2003). These traditional theories pertaining to the Transaction Models of Stress and Coping (Lazarus & Folkman, 1984) centre on an individual's perception of events; the thoughts and feelings associated with an individual's interaction with their environment, and considers the cognitive coping styles the individual may possess, or lack (Milner & Palmer, 2003).

This pioneering model conceptualising the role of cognition/appraisal in the stress response suggests that stress is the result of an imbalance between demands and resources, where an individual continuously monitors or appraises an event, demand or ongoing situation and analyses whether a problem or threat exists. This process is described as cognitive appraisal and is defined as a means through which an individual evaluates whether

an encounter with the environment is relevant to their wellbeing, and if so, in what ways (Folkman et al., 1986).

Lazarus and Folkman (1984) contend cognitive appraisal of a stressful event involves both primary and secondary appraisals occurring virtually simultaneously. These appraisals interact to determine the significance and meaning of the event with regards to the individual's well-being. During primary appraisal, personal significance of a situation is considered regarding values, beliefs, goals and commitments (Frydenberg, 2002). The implications for well-being are considered via the interpretation of events as either; (a) irrelevant with no implications for well-being; (b) benign/positive where the demands of the task are perceived as non-threatening and well-being preserved or enhanced; and (c) stressful, where the demands of the event are perceived to threaten well-being (Lazarus & Folkman, 1984). Secondary appraisal refers to a cognitive-evaluative process that focuses on minimising harms or maximising gains though coping responses (Frydenberg).

The central aspect of this model is whether the individual recognises or determines a problem or threat to exist. Once recognised, if the demands are greater than perceived resources and the situation is of personal significance, then a stress response occurs (Anshel & Delany). If the individual perceives they possess resources greater than the demands or the situation is considered benign or of benefit, then the event may be viewed as a challenge (Frydenberg, 2002). As such, coping resources are required following events perceived as stressful, whereas benign or positive appraisals do not require the same coping responses (Anshel & Delany, 2001).

Dvorakova et al., (2019) proposed an adapted version of the transactional model of appraisal and coping from Lazarus and Folkman (1984) to conceptualise the stress and coping process specific to an EA population as they undergo transition to university. The Appraisal and Coping Model During Transition to College (Dvorakova et al., 2019) views the coping process as dependent on a) environmental demands and stressors, b) individual resources to meet those demands, and centrally, c) an appraisal process that is dependent on both a) and b). From this perspective of stress, a key aspect in the investigation healthy coping is not only the nature of the subjective stressors themselves but also the individual's regulatory flexibility apparent in the subjective appraisal of these stressors, and whether the individual perceives themselves as having the resources to meet those challenges (Beck & Clark, 1997; Bonanno & Burton, 2013).

The model focuses on individual-personal and environmental-contextual characteristics as constituting the demands and resources impacting on both appraisal and coping processes in the transition to university (Dvorakova et al., 2018). These components are considered dynamic and interactive, influencing each other. Person-related characteristics include factors such as, social/economic/cultural background, pre-existing mental health issues, attentional, cognitive and socioemotional competencies. Contextual characteristics include the quality of the university environment and access to appropriate supports (Dvorakova et al., 2019). These aspects are proposed to influence whether a student's appraisal of events (e.g., demand) are potentially self-relevant in terms of being threatening or benign to one's well-being (i.e., primary appraisal). When situational demand is perceived as potentially self-relevant, the student evaluates if they are equipped with sufficient resources and tools to manage the demand (i.e., secondary appraisal). The evaluative distinction between seeing a demand as a threat and challenge is essential as a challenging event can be either appraised as a fearful stressor or as a learning opportunity with a corresponding biopsychosocial response (Blascovich, 2008).

Coping and Psychological Well-being in Emerging Adult University Students.

Individual-level appraisals shape students' coping efforts and thereby their daily functioning and well-being (Jamieson et al., 2010). Specifically, the stress and coping theory posits that when perceived demands exceed perceived existing resources, stress arises, and psychological well-being may deteriorate. The model suggests that mental health is understood as both a source of coping resources and a set of skills/competencies that are required across the lifespan. During major developmental transitions such as the transition to university, previously learned coping may not meet the new demands and therefore may need to be enhanced or replaced by higher order coping strategies (Compas et al., 2011; Skinner & Zimmer-Gembeck, 2007). When a cycle of demands exceeding resources becomes chronic, the risk for mental health disorders and other lasting consequences increases (Dvorakova et al., 2018).

There are three broadly established categories of coping including 1) problem-focused, 2) emotion-focused, and 3) meaning making coping (Lazarus & Folkman, 1984; Park & Folkman, 1997). Related coping strategies include, for example, problem solving and planning, soothing emotions, seeking supports, and making meaning of one's experiences based on religious/spiritual beliefs, respectively (Dvorakova et al., 2018). Furthermore, coping effectiveness is often associated with individuals' avoidance or approach of stressful

situations as reflected in their capacity to tolerate and accept/embrace unpleasant emotions, thoughts, and experiences (e.g., Kashdan & Rottenberg, 2010; Spinhoven et al., 2014).

In relation to university students, maladaptive coping strategies typically involve those which promote experiential avoidance (e.g., withdrawal, self-blame, or suppression), and have been associated with lower rates of educational persistence, higher rates of mental stress and psychological distress and drinking behaviours (Mahmoud et al., 2012; Scott et al., 2004). Furthermore, the rates of substance abuse among university students are double when compared to rates within the general population, with researchers suggesting substance misuse is a coping strategy used more often by young people attending university (Dvorakova et al., 2018; Martens et al., 2008; Welsh et al., 2019).

In contrast, approach-based/emotion-focused coping such as acceptance and positive reframing or appraisal of stressful events, is associated with improved psychological and physical well-being (Pritchard et al., 2007). Unfortunately, a recent report found that the most frequent coping strategies during stress for EAs were avoidance-based, specifically; a) sleeping (70%) and b) spending time online (64%; Dvorakova et al., 2018).

From a regulatory flexibility perspective, Dvorakova et al., (2018) suggest the effectiveness of coping depends on students' (a) sensitivity and appraisal of the current situation, (b) the range and variety of available resources and strategies, and (c) the reflective feedback loop that is involved in determining possible actions over time and learning from prior experience (Bonanno & Burton, 2013). Students' self-regulatory ability to pause, reflect, and then choose a coping strategy may be a key resource to enhance their overall well-being (Dvorakova et al., 2019).

Resilience and the Emerging Adult

A review of the literature suggests a lack of consensus regarding a definition and specific inner facets promote mind-body resilience. Broadly speaking, resilience can be described as the ability of an individual to "bounce back" in response to adversity and/or perceived stressful circumstances in a timely way such that psychophysiological resources are conserved (Haase et al., 2016; Resnick et al., 2011; Tugade & Fredrickson, 2004; Whitson et al., 2016). Resilience is considered a dynamic and contextual construct, requiring (a) presence of threat to development, and (b) adaptation to threat judged as "good," in the sense the individual can either engender a positive outcome or minimize/avoid negative consequences (Masten, 2019; Masten & Motti-Stefanidi, 2020). Resilience is not considered immunity from difficulty or distress but is demonstrated by the ability to adapt and recover well. The process

involves behaviours, thoughts and actions that anyone can learn and develop (Buckley et al., 2018; Luthar et al., 2000). High resilience is associated with faster cardiovascular recovery following subjective emotional experiences (Tugade & Fredrickson, 2004), less perceived stress, greater recovery from illness or trauma and better management of chronic pain (Resnick et al., 2011). Compromised resilience is associated with dysregulation of the ANS and measures of vagal regulation, as well as a range of psychological disorders (Marsland et al., 2017). Whilst these studies highlight the important role of resilience, there remains limited consensus regarding strategies for effectively promoting resilience in the EA university student.

An effective way to comprehensively understand resilience is to study this construct within specific developmental period; as assets and resources available to an individual change throughout the life span (Plocha & Bacigalupe, 2020; Rutter, 2007). The current research contended EA provides an opportune developmental period for targeting resilience. Specifically, further research into evidence-based frameworks, models and interventions aimed at cultivating stress-resilience and a range of healthy mind-body responses are needed to reduce increasing psychological stress and distress rates in EAs around the world.

Targeting resilience during this stage would promote self-awareness and mind-body regulation and assist in better understanding the impacts of current/past stress and other emotions stored in the body as well as familial/intergenerational stress responses providing a foundation for well-being and optimal growth of mind-body throughout life. Furthermore, mind-body resilience appears especially important for the young medical professionals (e.g., doctors, surgeons, and specialists) of tomorrow who will potentially spend their lives assisting the healing of others. With increasing rates of stress reported globally, their likelihood of treating stress-related mind-body illness and disease is highly probable.

As the young person makes this first life cycle transition into EA, the new and existing social support systems around them (i.e., connection to family, friends, and society) play a crucial role inresilience (Carter & McGoldrick, 1999). However, independently most individuals are also both capable and responsible for understanding and building their capacity for resilience. The individual can learn inner skills and resources to cultivate resilience, actively changing (i.e., re-wiring) their brain-body chemistry. This research aimed to target mind-body resilience at the individual level, whilst understanding that doing so in a group environment would also act to strengthen peer relations and ability for supporting and reinforcing such skills.

Mindfulness Meditation

According to Wolf and Serpa (2015) mindfulness is awareness, cultivated by paying attention in a sustained and particular way, on purpose, in the present moment, and non-judgementally. It is one of the many forms of meditation, where meditation can be considered as any way in which we engage in; 1) systematically regulating our attention and energy, 2) thereby influencing and possibly transforming the quality of our experience, 3) in the service of realising the full range of our humanity, and of 4) our relationship to others and the world (Bishop et al., 2004). Kabat-Zinn (2011) also proposes a two-component model of mindfulness; 1) the first component involves the self-regulation of attention so that it is maintained on immediate experience, and 2) the second involves adopting a particular orientation towards one's experience in the present moment, an orientation that is characterised by curiosity, openness and acceptance. Mindfulness can also be described as a way of being in the world or a *state of consciousness* (Page, 2019). Tang et al., (2015) also describes mindfulness meditation as a conscious and complex cognitive process involving concertation and receptive attention. However, these are just working definitions as mindfulness is something that needs to be practiced and experienced in order to be understood (Wolf & Serpa, 2015). Mindfulness is considered a complex and "felt" and known experience that scholars and practitioners alike have found challenging to describe in entirety for thousands of years. Overall, mindfulness teaches us how to relate to our experiences differently – even our stress and pain.

Mindfulness includes formal meditation practices undertaken regularly and informal practices aimed at bringing attention and awareness to all aspects of life (McConville et al., 2017). The mindful states of consciousness occurring during mindfulness meditation can be described as *state mindfulness*. When this expands and can be sustained, this leads to a predisposition to be in mindful consciousness states in everyday life which can then be described as *trait mindfulness* (Baer et al., 2006).

Lacking the capacity for present moment awareness can have several consequences for individuals, particularly during times of transition. These include: 1) not being aware of emotions and mood states and how they impact our experience, 2) carrying tension and stress in the body without being aware, 3) missed opportunity for positive emotional experiences and moments, 4) missing critical information for important decision making, and 5) the tendency to "hold onto" unpleasant emotions, moments and experiences in our mind and bodies long after they are finished (Wolf & Sepra, 2015). Below is a brief conceptualisation

of the mindfulness evidence base and research findings in three general categories: 1) symptom improvement, 2) biological markers in the body, and 3) neuroplasticity. These three aspects will be discussed in greater depth in Chapter 4.

Mindfulness and Symptom Improvement

There is a large amount of evidence and research demonstrating symptom improvement following MBIs for a wide variety of psychological and physical conditions. Primarily measured via self-report methods, these include significant improvements in psychological functioning such as depression, anxiety and stress (Jimenez et al., 2010; Masuda & Tully, 2012) and can facilitate a range of well-being outcomes including lower stress perception (Baer et al., 2006; Brown & Ryan, 2003; Weinstein, 2009). Lower pain and illness-related distress, increases in quality-of-life measures, sleep, functional status, more adaptive coping strategy use (Weinstein et al., 2009), and an ability to see situations more objectively with an increased capacity for responding rather than unconsciously reacting (Brown & Ryan, 2003) has also been reported.

Although mindfulness has typically been recognised as an important strategy and practice to enhance psychological and physiological well-being of clients (Kabat-Zinn, 2005), there is now increasing interest and research examining the impacts of MBIs to improve student well-being and enhance academic performance for at risk populations such as medical students. Mindfulness helps prepare health practitioners to be reflective, empathic and patient centred in their clinical practice (McConville et al., 2017). A systemic review of randomised control trials by McConville et al. (2017) on the efficacy of MBIs with health profession students found positive outcomes of mindfulness training in relation to decreasing anxiety, stress and depression and increasing positive mood states, self-efficacy, mindfulness and empathy in health profession students. A total of seven out of the 19 trials data were collected in a high stress period for students (prior to exams). Positive results currently provide support for mindfulness meditation training as an effective tool for coping with potential stressors of university life (McConville et al., 2017).

The benefits of MBIs have also demonstrated positive outcomes in healthy populations. In one meta-analytic review (Chiesa & Serretti, 2009), mindfulness was found to reduce stress and trait anxiety whilst increasing empathy in individuals without medical or mental health diagnoses. Shapiro et al., (2005) also found that in healthy psychotherapist trainees, mindfulness meditation assisted to reduce stress, negative affect, rumination and anxiety whilst increasing self-compassion and positive affect.

Mindfulness and Biological Marker Improvement

Research suggests the that the low-risk behavioural intervention of simply teaching an individual to pay attention with kindness to the present moment can have profound impacts on how the body functions. Numerous researchers are exploring psychoneuroimmunology; the study of the complex relationships between behaviour and psychological, neurological and immunological functioning (Wolf & Sepra, 2015). One example is the analysis of cortisol, the primary stress hormone released from the adrenal glands associated with immunosuppression (Spiegel., 2014). Changes in salivary and serum cortisol levels are an effective biomarker indicating a reduction in stress following MBIs (Matousek et al., 2009). In the study of epigenetics, studies have demonstrated measurable epigenetic changes in the genome following eight weeks of meditation training, with the downregulation of pro-inflammatory genes (Creswell et al., 2012). Furthermore, Epel et al., (2009) found that mindfulness training can have a beneficial impact on telomere length by reducing the cognitive stress and physiological arousal that can decrease cellular ageing. Cognitive stress and constant rumination on potential threats creates a stressful environment that in turn, shortens telomere length and the protective enzyme telomerase.

More specifically, mind-body strategies such as mindfulness meditation are proposed to benefit health and well-being and promote resilience through an integration of top-down and bottom-up processes which facilitate bidirectional communication between the brain and body (Muehsam et al., 2017). Top-down processes, such as regulation of attention and intention setting, have been shown to decrease psychological stress as well as hypothalamic-pituitary axis (HPA) and sympathetic nervous system (SNS) activity, promoting well-being and immunity (Sullivan et al., 2018; Taylor et al., 2010). Bottom-up processes such as breathing techniques and mindful movement, have been shown to influence the musculoskeletal, cardiovascular and nervous system function with positive changes in immune function and emotional well-being (Muehsam et al; Sullivan et al., 2018). The top-down and bottom-up processes employed in mind-body strategies, such as various types of mindfulness meditation, regulate autonomic, neuroendocrine, emotional and behavioural activation and promote adaptation in response to challenge and adversity (Taylor et al., 2010).

Mindfulness and Neuroplasticity

The idea of synaptic plasticity first emerged in 1894. Based on the belief that the number of neurons in the brain remained stable throughout life, the Spanish neuroanatomist Santiago Ramon y Cajal proposed that memories must therefore be formed by the

strengthening of existing neuronal connections (Ramires & Arbuckle, 2016). The psychologist Donald Hebb later elaborated on this idea proposing the model of Hebbian learning which suggests neurons that "fire together, wire together," meaning if two cells consistently fire at the same time, the strength of the connection between those cells grows stronger (Hebb, 1949; 2005). The model of Hebbian learning and the concept of "cells that fire together, wire together" has become increasing accepted in the neuroplasticity field for understanding how the brain changes based on experience (Dispenza, 2014; Siegel & Bryson, 2012).

Mindfulness meditation is considered to re-wire the brain, not through present-moment awareness but via the actual practice of coming back to the present moment with kindness time and time again (Wolf & Sepra, 2015). This then is re-wiring the brain through the ongoing practice of kind attention. Whilst previously held that following synaptic pruning of late adolescence (coinciding with EA), neural connections were largely static, advances in neuroimaging now understand the brain's capacity for neuroplasticity across the lifespan (Siegel, 2012).

Numerous studies have demonstrated evidence for the adaptive structural effects of mindfulness meditation on the brain. Specifically, compared to individuals who do not meditate, those who meditate regularly showed increased thickness of various areas of the pre-frontal cortex (PFC; Hölzel et al. 2008, 2010; 2011; Kang et al. 2013; Lazar et al. 2005; Luders et al., 2009; Pagnoni & Cekic 2007; Wang et al. 2020). Furthermore, mindfulness meditation has been associated with increased function in three key identified areas relating to growth and integration (i.e., self-reflective function, self-knowledge, emotion regulation and executive function), suggesting mindfulness meditation facilitates the required PFC "growth" and re-wiring needed to enhance these abilities (Seigel, 2012). Tang et al., (2010) also demonstrated significant changes in the white matter or neural tract in the anterior cingulate, responsible for self-regulation after four weeks of daily meditation practice. Holzel et al., (2011) found changes in grey matter density, or the actual number of brain cells in the hippocampus after eight weeks of Mindfulness Based Stress Reduction (MBSR).

Furthermore, Stapleton et al., (2020) examined the effect of a brief guided meditation on stress training workshop for novice meditators (n = 223). Participants' pattern of brainwave power bands at each meditation endpoint were compared with baseline measures (i.e., alpha, delta, and theta oscillations). Meditation competence via functional brain integration was evaluated using measures of high-frequency gamma synchronization. Overall

results suggested the brief meditation intervention had large varying effects on EEG spectra, and the speed of change from pre-meditation to post-meditation states of the EEG co-spectra was significant (Stapleton et al., 2020). Finally, specific mindfulness meditation practises have also been associated with functional changes in brain activity associated with increased empathy and compassion (Travis, 2020). Mindfulness will be discussed in greater depth in Chapter 4.

Mindfulness Theories and Mechanisms for Mind-Body Well-being

Consensus remains limited regarding facets and mechanisms via which mindfulness promotes mind-body well-being in EAs, especially those engaged in university studies. There are also limited resiliency models and frameworks examining mindfulness meditation as a catalyst for change in this population. Current proposed models and frameworks pertaining to this population suggest that changes in stress occur via present-moment attention on experience. It is generally argued the meditator disengages from thought streams, allowing for increased psychological space and awareness (Garland et al., 2015). These theories and models suggest that increased psychological space is the mechanism by which self-regulation and awareness occurs, enabling *psychological flexibility* in response to events, rather than reactively engaging in habitual response patterns (Bishop et al., 2004).

Similarly, Seigel (2010) describes response flexibility as the ability to pause before responding to events as an essential component of emotional and social intelligence. It is the process of becoming fully aware of what is taking place internally, and externally and restraining impulses long enough to consider various options for response (Seigel). Psychological flexibility is also defined as being consciously present with the capacity for changing or persisting in valued behaviour (Hayes et al., 2011). These findings have been supported by research in the neuroscience field, for the benefit of increased integration of sensory information (Kilpatrick et al., 2011). Below is a summary of relevant theories and mechanisms for the promotion of resilience and well-being as a result of mindfulness meditation.

Mindsight and Integration

Seigel (2010) describes the mind as an embodied and relational process. Seigel introduced the concept of mindsight to describe the process of looking within, perceiving the mind and reflecting on experience, as being an essential component to well-being. Mindsight is described as a process which allows the close examination of how an individual thinks, feels, and behaves. This promotes the reshaping and redirection of inner experiences to

promote freedom of choice in everyday actions, more power to create the future (Seigel, 2010).

Promoted primarily via mindfulness meditation practices, mindsight is suggested to offer the opportunity to explore the subjective essence of who we are as individuals and create a life of deeper meaning with a richer and more understandable internal world. This process promotes emotional balance, facilitates body and brain homeostasis, and improves relationships with others and us (Brown, 2013; Dana, 2018; Seigel, 2010). Like previously outlined research, Siegel also suggests this ability to focus attention on the internal world reshapes neural pathways, stimulating the growth of areas of the brain that are crucial to mental health. Neuroscience supports the idea that developing the reflective skills of mindsight activates the very circuits that create resilience and well-being and that underlie empathy and compassion.

This theory also introduces the concept of the *Window of Tolerance* (Seigel, 2010). Adaptation during personal change throughout life is often dependent on the width of an individual's Window of Tolerance. When this width is larger, homeostasis is maintained in the face of stressors. This window can be described as a band of arousal representing healthy functioning. When experiences push individuals outside this window, they fall into patterns of emotional coping and responses that are described as either ridged (e.g., depression, cut-offs, avoidance) or chaotic (e.g., agitation, anxiety, rage; Seigel).

The Window of Tolerance is synonymous with the concept of *integration;* a process of separate components linked together as a whole. This concept describes the capacity to stay within the Window of Tolerance (i.e., neither ridged or chaotic), and emerges when the left and right sides of the brain are functioning together (Seigel, 2010). Promoting integration within components of the mind and body enable the Window of Tolerance to widen promoting well-being and resilience. Siegel (2010) suggests that the capacity for mindsight changes the way the mind functions and moves both the internal and external life towards greater integration. The various components of integration will be discussed in more depth in Chapter 4.

Mindfulness to Meaning Theory and Positive Re-appraisal

The Mindfulness to Meaning Theory (Garland et al., 2015) is a model which provides an explanation of how mindfulness promotes *positive reappraisal*, the capacity to reconstrue stressful life events as benign or positive. The concept of positive-reappraisal of life-events is associated with the concept of eudaimonic resilience; defined as a dual process of self-

regulation and adaptive response after a stressful event involving conscious meaning making and therefore personal growth (Fredrickson, 2013; Gross, 2015). This definition of resilience differs from traditional theories, where return to baseline affect levels is often considered indicative of well-being. In contrast, this adaptive meaning making process involves evaluation throughout the lifespan; where successfully navigating the challenges and stressors associated with previous life stages equips the individual to make purposeful meaning of such events and experiences in a way which fosters mental health and growth (Park, 2013).

The Mindfulness to Meaning Theory (Garland et al., 2015) contends mindfulness promotes deidentification from thoughts, emotions and narratives about self, others and the world, promoting flexible selection of adaptive responses (Shapiro et al., 2006), creating psychological space. This facilitates nonthreatening reflection of stressful events, increases openness to alternative viewpoints, fosters reasoning (Kross & Grossman, 2012), promotes a fertile ground for constructive reframing of one's circumstances (Garland et al., 2015) and allows for adaptive and prosocial action leading to increased life purpose and meaning. The researchers also contend that through acceptance of experience, mindfulness may be a key mechanism that underlies the therapeutic efficacy of reappraisal for promoting positive psychological outcomes (Garland).

This model provides a comprehensive explanation of how mindfulness cultivates psychological space and self-regulation skills, however the complex nature of how flexible perspective taking and positive re-appraisal a recultivated remains theoretical and worthy of further exploration. The researchers highlight the model and process is yet to be fully specified, evaluated and expanded (Garland et al., 2015). Furthermore, the potentially critical component of self-compassion (discussed below) in cultivating positive emotions and adaptive appraisals during times of suffering is yet to be examined in an EA university population. Skills in fostering a compassionate self-relationship are needed to break maladaptive and conditioned habitual patterns of appraisal in relating to the self and experience (Marhsall & Brockman, 2016). In building upon the Mindfulness to Meaning Theory, self-compassion also offers a tangible and comprehensive element and skill set for directly contacting and accepting painful emotion and sensation in the body. It is argued that both these skills are needed to respond adaptively (Marshall & Brockman; Desmond, 2015).

Overall, there are currently limited mindfulness models providing a theoretical perspective and evaluation of the process via which mindfulness cultivates specific resources and mechanisms associated with resilience. There is also limited application of such models

to specific developmental stages, such as EA, considering the unique neurological and systemic processes such as life cycle transitions during this crucial life stage. This appears critical to provide informed interventions designed to target such growth and adaptive meaning making. This theory will be discussed further in Chapter 3.

The Role of Self-Compassion

Compassion is defined as our emotional response rather than a cognitive response to the recognised suffering in another and the authentic wish to relieve this suffering (Wolf & Sepra, 2015). *Self-compassion* is the same as compassion, but the recipient is oneself. Self-compassion is defined as being compassionate towards oneself; celebrating and enjoying oneself when life is going well and in the absence of stressors, as well as bringing a kind and forgiving perspective to oneself in the face of stress and adversity (Desmond, 2017). Neff (2003) suggests three components of self-compassion; 1) mindfulness (being aware of the pain), 2) shared humanity (recognising that suffering is a part of being human), and 3) self-kindness (being kind to oneself).

Whilst self-compassion is a relatively new concept in western psychology, research has demonstrated that positive impacts on self-compassion on well-being, coping and biomarkers related to stress as well as decreases in psychopathology. A meta-analysis conducted by MacBeth and Gumley, (2012) found consistent results for increased self-compassion being associated with lower depression, anxiety and perceived stress. Self-compassion has been shown to correlate positively with happiness and life satisfaction (Neely et al., 2009), positive affect (Leary et al., 2007), optimism (Neff et al., 2007), and acceptance (Neff et al., 2005). Conversely, research suggests that self-compassion correlates negatively with negative affect (Leary et al., 2007), rumination, emotional suppression, and avoidance (Neff et al., 2005; Thompson & Waltz, 2008). Self-compassion also supports increased health related behaviours such as stopping tobacco use (Kelly et al., 2010), reducing alcohol use (Brooks et al., 2012) as well as buffering negative outcomes in chronic pain patients (Costa et al., 2011) and reducing the negative emotional impacts and stress associated with illness (Brion et al., 2014).

Recent research also suggests self-compassion has a positive impact on biomarkers in the body associated with disease and ageing. Arch et al., (2014) demonstrated self-compassion training in women improved anxiety and cardiac responses in a stress situation, and reduced stress activation as measured by alpha-amylase, a salivary enzyme. Breines et al., (2014) also compared a stress-induced inflammation marker (interleukin-6) in the blood of

healthy adults following exposure to a standard laboratory stressor. Those with higher self-compassion had significantly lower levels of inflammatory markers, suggesting self-compassion may protect from inflammatory related disease.

A Randomised Control Trial (RCT) on the efficacy of an intervention for cultivating mindful self-compassion conducted by Neff and Germer (2013) demonstrated that compared to the control group, those in the intervention group reported increased self-compassion, mindfulness, compassion for others and life satisfaction and lower depression, anxiety and stress. These results suggest that interventions aimed to increase self-compassion will produce meaningful health outcomes for both clinical and non-clinical populations (Wolf & Sepra, 2015).

Skills in fostering a compassionate self-relationship are also needed to break maladaptive and conditioned habitual patterns of appraisal in relating to the self and experience (Marshall & Brockman, 2016). In building upon the Mindfulness to Meaning Theory, self-compassion also offers a tangible and comprehensive element and skill set for directly contacting painful emotion and sensation in the body, with kindness. It is argued that both these skills are needed to respond adaptively (Marshall & Brockman, 2016; Desmond, 2015).

Models integrating trait mindfulness and self-compassion as key mechanisms of top-down and bottom-up processes for self-regulation and resilience for EAs are essential. The capacity to know, love and forgive oneself during all stages of life is a vital component in understanding and ultimately releasing negative thoughts, perceptions and emotion attached to past events which surface in the present moment, impacting on resilience and functioning. Through the capacity to become self-aware of unconscious thoughts, perceptions and emotions and work to release these, a change in consciousness is possible, thus reducing stress and other negative experiences and promoting the experience of more elevated and positive emotions (Dispenza, 2014; Hawkins, 2012).

Positive Emotions

Dispenza (2014) contends that whilst negative or survival emotions are primarily derived from stress hormones (e.g., cortisol) and promote an increase in limited states of mind and body, the experience of *positive or elevated emotions* promote a change in consciousness. This experience positively impacts on both psychological and physical functioning especially when associated with clear intentions (Dispenza). When applied to resilience, this concept and skill enables for a surrendering of negative emotions anchored to past events, and promotes

the space for creating, experiencing and using positive or elevated emotions to relate to present moment and future events (Dispenza, 2014). For the EA university student experiencing their first predictable life-cycle transition and unique potential stressors associated with this developmental period, these skills and mechanisms appear essential in promoting mind-body resilience and an adaptive foundation for moving through subsequent life-cycle transitions. To date, no resiliency model or framework has been proposed and validated which integrates these facets or mechanisms with application to an EA university student population or examines the efficacy in at-risk populations. This raised the question of how to foster these facets during EA.

Mindfulness Based Interventions

In addition to the efficacy of MBI's and interventions designed to enhance mindful self-compassion discussed above, most interventions aimed at specifically reducing stress in EA university students have included MBIs. This type of intervention was first introduced to therapeutic settings by Kabat-Zinn (1990, 2003, 2005), who developed Mindfulness Based Stress Reduction (MBSR) and by Linehan et al (1993) who developed Dialectical Behaviour Therapy (DBT), a therapy commonly used as an intervention for borderline personality disorder. Mindfulness meditation skills are also utilised in Mindfulness Based Cognitive Therapy (MBCT; Teasdale et al., 2000) and Acceptance and Commitment Therapy (ACT; Hayes et al., 1999). The effectiveness of mindfulness-based approaches to treatment has been well established (Shapiro et al., 2006).

More recently, mindfulness skills are being utilised in approaches which include a somatic aspect (e.g., Eye Movement Desensitization and Reprocessing) to provide mind-body approaches to healing. However, as a "stand-alone" intervention, mindfulness meditation encompasses a set of psychosomatic practices operating to enhance self-awareness and regulation, optimising effective processing of present moment experience (Jain et al., 2007; Robins et al., 2006). These skills have demonstrated both significant and rapid changes in brain activity, increasing health and immunity and effective processing of unconscious and outdated emotional programs and functioning (Dispenza, 2014; Fox et al., 2014; Stapleton et al., 2020). It is argued in this research that when used effectively, mindfulness meditation is a mind-body approach targeting well-being and health of the individual holistically.

Current MBIs have demonstrated efficacy in decreasing stress (Carmody & Baer, 2009) as well as anxiety and depression (Carmody & Baer, 2008) and increasing levels of resilience and self-compassion (Shapiro et al., 2005). Application of MBI's with health

profession students (i.e., identified as at risk for stress and psychological distress compared to the general population) have demonstrated positive outcomes for decreasing stress, anxiety and depression and increasing positive mood states, self-efficacy, mindfulness and empathy (McConville et al., 2017).

In response to the increasing rates of stress and psychological distress among EA university students, MBI's are beginning to integrate into university stress-reduction programmes globally. These programs vary in content, strategies and approach, and consequently systematic reviews and meta-analysis of randomised controlled trials (RCTs) assessing MBI effects on university students' mental and physical health shows varying well-being outcomes. Dawson et al. (2020) investigated fifty-one RCTs with university students and found that in comparison with passive controls, and when measured shortly after intervention completion, MBIs improve distress, anxiety, depression, well-being, rumination, and mindfulness with small to moderate effect sizes. Interestingly within this research, no benefit was found for blood pressure, sleep, life satisfaction, resilience, worry, and thought suppression. Evidence for self-compassion was also inconclusive. These effects lasted beyond three months for distress and mindfulness. Compared with active control groups, MBIs were found to significantly improve distress and state anxiety, but not mindfulness, depression, well-being, affect, trait anxiety, or emotion regulation. These conflicting results pertaining to MBI's and increasing rates of stress and psychological distress in this population highlights partial understanding within the mindfulness and resilience fields regarding the content and process of effective MBIs with EAs. This research will be discussed in detail in Chapter 5.

Quality of Research into Mindfulness Based Interventions

Dawson et al. (2020) conducted a systematic review and meta-analysis of MBI's with university students. The results suggested the most important limitation of this body of evidence is the quality of the included RCTs. The researcher's risk of bias assessment supported claims that MBI study quality is not improving over time at a desirable rate (Goldberg et al., 2017). Although the review aimed to report findings relative to an overall university student population, the generalisability of findings was limited.

Studies predominantly included female students and were conducted in the USA, which encompasses unique learning environments in comparison with universities located in other countries (Wu et al., 2015). There were high levels of statistical heterogeneity, reflecting the high clinical and methodological variability among MBIs, among the studies, and among participants. The researchers also found there was a variety of mindfulness courses assessed

by the included studies, hampering efforts to combine the evidence available in a meaningful way. Similarly, cultural, and social factors not taken into account in the review may explain variations in the effectiveness of MBIs both at the study and at the individual levels (Purser et al., 2016).

Furthermore, with regards to physiological measures all but blood pressure were self-reported outcomes, and therefore subject to more biases than other types of outcomes (Cohen, Manion, & Morrison, 2011). An understanding of the effects of MBIs on physiological markers is still emerging (Creswell & Lindsay, 2014). In this review, no findings were statistically significant. However, as each meta-analysis only included two very small studies, power was limited. In addition, the inclusion of non-clinical participants may have reduced the likelihood of detecting physiological improvements, and the modification of biological parameters may require more time and practice.

Although the relative effects of MBIs did not significantly differ from other interventions, there are limitations in construing these findings. First of all, variability was prevalent between the active control interventions, most prominent being the incorporation of existing stress-reduction programmes rather than placebo- type controls for non-specific effects. The authors suggest this restricted the interpretation of meta-analysis findings, as it was difficult to identify which interventions were more effective than others. Second, each active control meta-analysis incorporated a relatively small number of studies in comparison with passive controls, subsequently reducing the power to detect a true effect size (Borenstein et al., 2009).

Summary and Gaps in the Literature

This literature review has highlighted that whilst EA presents as a unique and exciting developmental phase in young people's lives, the immense changes to multiple life domains and additional stressors occurring during this first Life Cycle Transition (i.e., launching from family of origin) may also represent a period of increased vulnerability to psychological distress. This is especially evidenced for EA's engaging in university studies, with international research reporting increasing and alarming rates of mental ill health around the world. With appropriate guidance, EA can represent a unique opportunity to build resilience and coping skills to sustain and expand throughout adulthood.

Despite consensus among researchers, practitioners, government bodies and university institutions regarding the vulnerability of this population, limited research has directly examined how to promote resilience during this developmental stage, particularly within

Australian university settings. The increasing rates of stress and psychological disorders within young Australian university students highlights fundamental research gap in the resiliency and EA literature pertaining to this population. Researchers and universities are well positioned to identify symptoms of stress and psychological distress in EA students and implement preventative and developmentally appropriate supports and interventions. The development of specific, validated mindfulness-based models for building resilience may guide the understanding of relevant well-being factors and assist to inform effective MBIs. For this to occur, the conceptualisation of resilience during EA must be better understood and resiliency mechanisms identified and targeted. Within Australia, to the author's knowledge, there are also very limited universities developing mindfulness-based models and frameworks or offering MBIs to young students as part of their study program. Within this region, and worldwide, there remains the evident need to provide greater research and support to EAs, including a greater focus and understanding on effective MBIs for EA's engaged in high demand program**s.**

The Current Thesis

Given the widespread and increasing rates of psychological distress and psychopathology in EA university students (Auerbach et al. 2016; Dvorakova et al., 2018; Lo et al., 2020; McConville et al., 2017), the overarching aim of this PhD was to improve understanding of this developmental stage and provide an evidence-based framework and intervention for enhancing resilience and well-being via mindfulness-based approaches. To achieve this aim, a series of research questions were developed:

1. What are the mental health concerns of EA university students from different regions around the world? (Chapter 1 and 2)

    1.1 How is resilience conceptualised in relation to these populations?

    1.2 What is the role of resilience in the prevention of psychological distress among EA university students studying in different higher education institutions around the world?

2. Can a more comprehensive definition of resilience be provided relevant to this population? (Chapter 3 and 4)

    2.1 What mechanisms underpin resilience in EAs?

    2.2 Can a comprehensive mindfulness-based model be developed and validated in a sample of EAs studying in Australia?

2.3 In addition to increasing resilience and psychological well-being, can this model promote EA university student's capacity to positively re-appraise life events as benign or of benefit?

3. What strategies, frameworks and interventions promote mind-body resilience in EA university students?

3.1 Can the newly developed model inform the development of a MBI? (Chapter 5 and 6)

3.1 Can the efficacy of this MBI be evaluated with a sample of EA medical students studying in Australia (i.e., at elevated risk of stress and psychological distress)?

Outline of Studies

To answer these research questions, a mixed methodological approach was employed with three sequential studies conducted. A brief description of each study is outlined below, including the research questions (RQ) addressed in each study.

To investigate the role of resilience in mental health for EA university students studying in different regions, Study 1 (Chapter 2) investigated the role of resilience in the prevention of perceived stress, psychological distress (i.e., anxiety, depression and stress) and perceptions of satisfaction with the university experience among EA university students from Australia, Hong Kong and USA (RQ 1).

Chapter 3 aimed to extend the research pertaining to EA resilience by providing a more comprehensive definition and understanding of adaptation during this first life cycle transition. This chapter proposed the new term, EI, to describe the process of fostering adaptive self-regulation, meaning making, and self-compassion during this developmental stage with an emphasis on understanding the integrated neurobiology and balanced, adaptive components of mind and body considered within the context of relational systems. Chapter 3 also introduced a new mindfulness-based resiliency model, The MEI, with Study 2 (Chapter 4) investigating model validity with a sample of EA university students studying in Australian (RQ 2). It is proposed that models and frameworks for promoting positive re-appraisal and resilience must be specifically evaluated with populations to ensure accuracy and efficacy. Such application considers the unique neurobiological, developmental tasks, contextual factors such as political and social aspects and impending/current life-cycle transitions associated with this life stage.

On the foundation of this model and framework, Chapter 5 reviews MBI with this target population. This chapter also proposes necessary components of MBIs designed to

target mind-body resilience and maximise well-being outcomes. Study 3 (Chapter 6), a Randomised Control Trial designed to evaluate the efficacy of the six – session pilot Mindful Awareness Resilience Skills Training Program MARST-P with EA medical students studying in Australia. Specifically, this study focuses on the evaluation of the program's efficacy in targeting the components identified within the MEI (RQ 3). Finally, Chapter 7 consolidates theory and findings from this body of research to guide future resiliency models and frameworks and MBIs specific to EA university student populations. Recommendations for future practice, interventions and research are also discussed.

Below is a brief overview of the newly proposed concepts of the novel concept and framework of and the MEI. These are discussed in detail in Chapters 3 and 4.

Overview of Eudaimonic Integration

The focus of this thesis was to extend the research pertaining to EA resilience by providing a more comprehensive definition and understanding of adaptation during this first life cycle transition. This current research proposes the new term, EI, to describe the process of fostering adaptive self-regulation, meaning making and self-compassion during this developmental stage with an emphasis on understanding the integrated neurobiology and balanced, adaptive components of mind and body considered within the context of relational systems. That is, where the individual is moving towards a differentiated sense of self within social spheres. In line with previous research, it is proposed that through moving towards integrated neurobiology, the individual can navigate these stressors and relationships with increasing psychological flexibility and self-differentiation, remaining healthily connected and confidently autonomous during times of adversity (Seigel, 2010; Brown, 2012). This new concept further extends systemic theories by proposing the quality and balance within relationships with others is not the only relationship salient to a resilient stress response. Moving towards an accepting and compassionate self-relationship, is proposed as a critical foundation during EA in moving towards balance and stability of mind and body and self-differentiation. This research contends that self-compassion is an essential component of maintaining self- regulation, psychological flexibility and beneficial meaning making throughout life.

This research proposes that EI fluctuates across time and is an ongoing process of cultivation requiring effort and commitment to create and sustain, much like a muscle within the body. However, it is also proposed that over time, despite these fluctuations, with committed action EI within the individual increases in ever expanding ways. Specifically, this

suggests EI is a transitory state which, when engaged in repeatedly in over time, may accrue into trait or dispositional EI.

Overall, this new theory and concept proposes that through an evolving process of active integration and self-differentiation, the capacity for adaptive self-awareness and regulation, self-compassion, flexible perspective taking and beneficial meaning making are possible across the lifespan. It is proposed that these elements naturally lead to greater experience of positive emotions, psychological well-being and overall adaptive stress response. For the EA, fostering integration and balance within the mind and relationships (i.e., both self and others), is particularly salient as they move towards self- differentiation and the establishment of emerging and adult identities. The opportunity for continued growth and maturity in life and relationships is inevitably linked to exposure to stressors and adversity, particularly with others. These interactions and events provide the opportunity to learn to respond with intentionality and flexibility, gain insight and understanding, and cultivate compassion to move forward with increased resources.

The new theory of EI contends that the whole premise of resilience and well-being is founded on the *quality, flexibility and health* of relationship with self, others and the world across the lifespan; and our capacity to bring awareness to and make beneficial meaning of events within these relationships. This, in turn, facilitates growth and integration in the face of commonly shared challenges associated with being a human being. This concept embodies the notion that it's not just how we can assist individuals to handle stress better, but rather how can we assist them to flourish, find beneficial meaning and lessons in adversity, and reach their potential in ever increasing ways as they face the inevitable challenges associated with being human.

Overview of the Model of Eudaimonic Integration

Building on the Mindfulness to Meaning Theory (Garland et al., 2015), this thesis also proposes the development of a new model, MEI. The MEI is a longitudinal process model of mindful emotion regulation (both positive and negative) and quality and integration of relational systems (with self, others and world), promoting response flexibility, positive emotion regulation and compassion as a foundation for beneficial meaning making of life events and challenges, which in turn, fosters eudaimonic resilience, growth and personal potential across the lifespan. Depending on the application of the model to a specific population, the unique developmental tasks and impending/current life-cycle transition are also considered to provide guidance around the nature and context of specific stressors to

inform the development of appropriate interventions. The model is not intended to be linear in process, but rather describe a comprehensive and interwoven relationship between variables which over time, work in conjunction to foster expanding levels of EI within the individual and the systems which surround them.

The MEI describes the process of increasingly embodying adaptive psychosomatic practices and resources during present-moment experience, including moments of adversity. Specifically, these facets include increased self-awareness and regulation, psychological flexibility, positive emotions with a compassionate self-relationship as key. Cultivated through mindfulness, these components are proposed to underpin resilience and foster the capacity for positive re-appraisal. This research contends these facets form the foundation for healthy, integrated neurobiology and balanced, adaptive components of mind and body considered within the context of relational systems. That is, where the individual (e.g., EA) is moving towards a differentiated and mature sense of self within social spheres.

Through healthy, integrated neurobiology the EA can navigate launching from home and transition to university with resiliency skills that foster self-differentiation; remaining healthily connected to others and confidently autonomous during times of adversity (Brown, 2012; Seigel, 2010). This research further expands systemic theories by proposing the quality and balance within relationships with others is not the only relationship salient to both resilience and self-differentiation. Moving towards an accepting and compassionate self-relationship is proposed as a critical foundation during EA for fostering embodied resilience, especially when engaged in university studies.

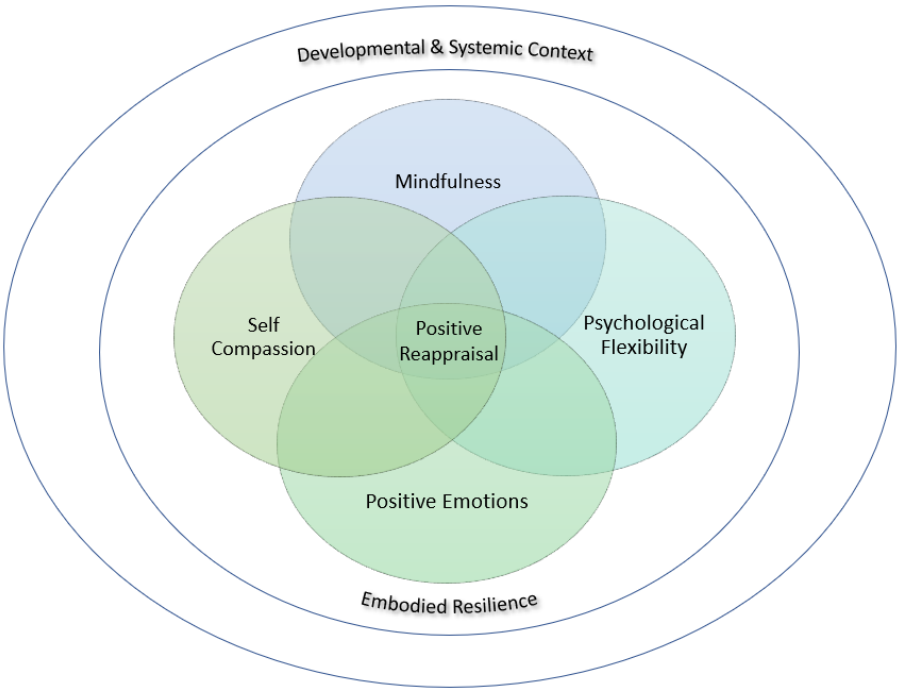
Overall, this new perspective proposes through an evolving process of EI and increasing self-differentiation, the capacity for adaptive self-awareness and regulation, self-compassion, flexible perspective taking and therefore beneficial meaning making are possible across the lifespan. It is proposed that these elements naturally lead to greater experience of sustained positive emotions, psychological well-being and adaptive stress responses. By optimising present moment processing, it is also proposed embodied resiliency skills also enable greater capacity for caring for and releasing negative thoughts and emotions from the body as they arise, promoting empowerment, authenticity and acceptance of experience in every now-moment. This promotes the capacity to bring awareness to and make beneficial meaning of events within these events and relationships. Overall, this program of research aimed to convey that it is not simply important to assist young people to handle stress better,

but rather assisting them to embody their authentic self to empower and cultivate adaptive meaning and growth in every now-moment, reaching their potential in ever increasing ways.

The MEI proposes an integrated systems view of how mindfulness promotes resilience, fostering response flexibility, positive emotion and self-compassion as foundations for personal beneficial meaning making of life events and challenges. Figure 1 presents the MEI below.

Figure 1

Model of Eudaimonic Integration



Note. A graphical depiction of the MEI. A longitudinal process model of mindful emotion regulation (both positive and negative) and quality and integration of relational systems (with self, others and world), promoting response flexibility, positive emotion regulation and compassion as a foundation for beneficial meaning making of life events and challenges, which in turn, fosters eudaimonic resilience, growth and personal potential during EA.

CHAPTER TWO

STUDY ONE: EXAMINING RESILIENCE, PERCEIVED STRESS AND PSYCHOLOGICAL DISTRESS AMONG EMERGING ADULT UNIVERSITY STUDENTS FROM DIFFERENT REGIONS.

Chapter Overview

The aim of this chapter is to review the mental health concerns among EA university students from a selection of regions around the world. Globally, increased rates of stress and psychological distress, and increased attrition rates are being observed in university students from developed regions (Auerbach et al. 2016; Centre for Collegiate Mental Health, 2016; Dvorakova et al., 2018; Lo et al., 2020; McConville et al., 2017; The National Centre of Excellence in Youth Mental Health, 2017; World Health Organisation World Mental Health Survey, 2017). These findings highlight the ongoing and critical need for researchers and institutions to better understand stress and psychological distress in young people transitioning to university as well as strategies for reducing the psychological and physical impacts of stress and most importantly better understanding and fostering resilience.

The first part of this chapter reviews research and data regarding EA university student mental health from three developed regions around the world; Australia, USA and Hong Kong. These regions have been chosen to examine the similaries and differences in resilience, perceived stress, psychological distress, and SAE between EA university students studying in these locations. A literature review of current conceptualisations and definitions of resilience is also provided, with specific application to the EA university student. The second part of this chapter presents study 1, which examined the role of resilience in the prevention of stress and psychological distress among EA university students from different higher education institutions (i.e., Australia, Hong Kong and Florida-USA).

Issues Among Emerging Adult University Students in Australia

Australian university students report significant levels of stress and psychological distress during EA, with the prevalence of psychopathology considered greatest between the ages of 18 to 25 (Eskin et al., 2016; Slade et al., 2009). Compared to same age peers not engaged in university studies, university students had significantly higher levels of psychological distress compared with community peers. Leahy et al. (2010) assessed the prevalence of psychological distress in a sample of undergraduate students from the University of Adelaide using the Kessler Psychological Distress Scale (K10) with a cut-point of ≥ 22 (high to very high distress) and found that they had a significantly higher prevalence

of high psychological distress than same age community peers (48% vs 11%). The Kessler Psychological Distress Scale (K10) is a well-validated, highly useful clinical measure of psychological symptoms noted for its ease of use, accessibility, high predictability, and high factorial and construct validity (Easton et al., 2017). Similarly, Stallman (2009; 2010) examined the prevalence of psychological distress in students from two large Australian universities using the K10, finding that university students had a significantly higher prevalence of elevated distress (scores: 16–50) and very high distress (scores: 30–50) than their community peers (84% vs 29% and 19% vs 3%, respectively).

The National Union of Students (NUS), with the support of headspace: National Youth Mental Health Foundation, conducted a National University Student Wellbeing Survey in the second half of 2016 to provide a snapshot of the key stressors and factors affecting the wellbeing of Australia's university students (Rickwood et al., 2017). The survey collected self-report data and investigated how the academic, financial, and mental health experiences of university and TAFE students impact their time at university. There were 3303 participants in the survey from 40 universities and 30 TAFEs. The results are considered separately for 16–25-year-old students (n=2637) and 26-50+ year old students (n=652), to consider separately the findings for emerging/young adults and mature adults in the university education system. Results showed for young students (i.e., 16-25 years of age), 67% rated their mental health as "fair" or "poor" compared with 39% who rated their physical health as "fair" or "poor." A total of 65% reported high or very high psychological distress. Only 1.6% reported that no symptoms of mental health problems impacted their study in the past year. A total of 27% had accessed on-campus counselling services, and 24% rated their experience as negative and 28% had accessed on-campus medical services, with 13% rating their experience as negative (Rickwood et al., 2017).

The main mental health-related factors affecting study were feeling stressed, low motivation, feeling anxious, and low mood. A very concerning 35% of young adult students and 25% of mature adult students reported thoughts of self-harm or suicide affected their studies. There were 72% of young adult students and 62% of mature adult students who reported that there had been at least one day in the past month when they were totally unable to work or study due to symptoms of mental health problems. There was a high level of service use for mental health problems evident among the sample, with two-thirds of both age groups having sought help from a mental health professional at some point in their lives for a personal or emotional problem. There were 27% of young adults and 32% of mature adults

who had accessed on-campus counselling services in the past 12 months, and 28% and 26%, respectively, who had accessed on-campus medical services. Younger women were more likely to use both types of services than younger men, but this gender difference was not evident for the older students where the gender difference was reversed. Wait times were longer for counselling than medical services. Medical services were rated more favourably than counselling services (Rickwood et al., 2017).

Similarly, a report conducted by Orygen, The National Centre of Excellence in Youth Mental Health (2017) into the mental health of Australian university students proposed a lack of government policy, attention and resources directed to understanding the issues of this population has impacted on the capacity for both the university and mental health sectors in effectively responding to the needs of this group. Australian Census data from 2015 indicates approximately 1.4 million students are engaged in university education, with approximately three in five students aged between 15 and 24 years. The report highlighted that at least 25% of these young people will experience stress and psychological distress in any year enrolled. Student stress and mental ill-health are also associated with decreased satisfaction with the university experience and increased attrition rates. This can have a detrimental impact on both future mental health, education and employment pathways.

In Australia national data is not regularly collected or monitored on experiences of mental ill-health (either diagnosed or not) among university students and there is a paucity of Australian based research into this population (The National Centre of Excellence in Youth Mental Health, 2017). National mental health prevalence data indicates that 25% of young people experience mental ill-health each year (Australian Bureau of Statistics, 2016). As such, it could be conservatively estimated that upwards of 210,000 Australian university students aged 18-25 years will experience mental ill-health this year. These studies highlight the prevalence of mental ill-health among university students and the need for greater understanding of resilience in this population. Whilst Australia provides an excellent standard of higher education and response to youth mental health, the mental health of university students (and university students more broadly) has largely been absent at a government policy level impacting on the capacity and capability of the university sector and mental health sectors to effectively respond (The National Centre of Excellence in Youth Mental Health, 2017).

With approximately a quarter of a million young Australian university students likely to experience stress and psychological distress during any one year at university (The

National Centre of Excellence in Youth Mental Health; 2017), it is imperative this research gap is addressed. The report concludes that the mental health and well-being of young people engaged in university education is an issue "right on the doorstep of university researchers, educators, as well as a student health and peer workforce who have the skills and capacity to develop and trial new and innovative approaches to university student mental health (p. 7)." Overall, the mental health of young Australian university students is a surprisingly neglected area of research which urgently warrants further empirical investigation.

Issues Among Emerging Adult University Students in USA

In other developed regions, such as the USA and Canada, understanding and improving university student mental health has received greater attention from government, universities, and philanthropic organisations in recent years. However, the issue of young university student's mental health remains current and relevant. A report from Centre for Collegiate Mental Health (2016) in USA consisting of data from 139 universities comprising over 100,000 students showed depression, anxiety and social anxiety continue to rise. More specifically, student's self-reported distress levels for depression, generalised anxiety and social anxiety continued to evidence slight but persistent increases from 2010 to 2016 (Centre for Collegiate Mental Health, 2016).

The 2019 Annual Report of the Centre for Collegiate Mental Health reported that anxiety continues to be the most common problem among university students from USA (62.7% of 82,685 respondents), with clinicians also reporting that anxiety continues to be the most common diagnosis of the students that seek services at university counselling centres. Consistent with the national trend, universities within the USA have continued to observe a rise in the number of students seeking services for stress and anxiety disorders over the past 8 years (Son et al., 2020). In 2018, slightly over 50% of students reported anxiety as the main reason for seeking services

Other research conducted by Eisenberg et al. (2007, 2009, 2013) estimated the prevalence of any depressive or anxiety disorder was 15.6% for undergraduate university students and 13% for postgraduate students. At the severe end of psychological distress, the study found 2% of students reported having suicidal thoughts in the past four weeks. Despite the increasing need for mental health care services at postsecondary institutions, alarmingly, only a small portion of students experiencing depression and suicide ideation contact their institution counselling centres (Shuchman, 2007), perhaps due to the stigma associated with mental health. Prince (2015) also described a trend of increasing numbers of students

presenting to university counselling services and increasing levels of complexity and severity of mental ill-health. These findings highlight the need for further research into understanding of stress and psychological well-being in this population.

Issues Among Emerging Adult University Students in Hong Kong

According to survey data of depression, anxiety and stress in 7915 first-year university students in Hong Kong in 2006, depression, anxiety and stress levels of moderate severity or above were found in 21%, 41% and 27% of the respondents respectively (Wong et al. 2006). In a study conducted in 2010, 68.6% out of 529 Chinese college students recruited from four universities in Hong Kong reported suffering from insomnia (Sing & Wong, 2010). A study examining depression in first year university students from Beijing and Hong Kong in 2008 reported a higher prevalence of current depressive symptoms in Hong Kong in comparison with their counterparts in Beijing (Song et al. 2008).

It is also important to acknowledge the ongoing political turmoil and significant social unrest occurring within Hong Kong, and the potential confounding impacts of these situations on the mental health and well-being of young people attending university in this region. A study conducted by Ong and Chu (2022) outlined multiple impacts on students wellbeing as a result of these situations. According to this study, students reported increased difficulties and disruptions to their academic, leisure, family, and social life. These disruptions were shown to frequently cause frustration, anxiety, fear, and a sense of isolation (Son et al., 2020). They concluded that negative everyday life experiences predicted psychological distress in conflict-affected and post-conflict settings in the region.

Student's mental health was also significantly impacted, with loneliness, anxiety, and stress reported as the three main emotional states experienced by students during this time (Ong & Chu, 2022). These were due to the disruptions, change of atmosphere in the living environment, and uncertainties about their academic progress as a result of these conditions (Ong & Chu, 2022). Some stressors may also be partly due to decisions taken by the university which included changing the mode of learning, modifying the assessment structure, cancellation of event and hall activities, sending students home for their personal safety. These aspects must be considered in the understanding of EA university student psychological distress, stress, resilience and academic experience.

More broadly speaking, Lo et al., (2018) examined mental health in 135 Hong Kong university students and reported ten out of the 135 cases (1 in 14) as showing active suicidal ideation or recent suicidal attempt(s) that required urgent psychiatric intervention. In this

study the top three recurrent themes of stress and maladjustment were academic work and stress (62%), family stress (33%), and peer/romantic related stress (18%). In the broader context, there are significant signs regarding poor adolescent mental health in Hong Kong. While the caseload of the child and adolescent psychiatric teams of the Hospital Authority rose from 18,900 in 2011–12 to 28,800 in 2015–16 (i.e., an increase of more than 50% in 5 years; Lam et al. 2015), with the complexity of the problems across multiple disciplines and sectors. These results highlight potential service gaps in the existing health and educational institutions in Hong Kong.

Whilst mental health concerns are prevalent internationally, in comparison to regions such as Australia and USA these results suggest greater need for understanding on cultural expectations of academic performance both at an individual and systemic level (Lo et al., 2018). Furthermore, when considering systemic aspects, Lo et al. also contends that culturally students in regions such as Hong Kong wish to appease their parents, often following parental instructions and wishes regarding study and career pathways even when they have no interest in the area. As a result, both family stress and academic stress can impact significantly on well-being. Finally, these researchers suggest that systemically, moving towards self-differentiation can be challenging at times for students within such cultural contexts, as strong expectations and dynamics regarding the young person's role in caring for parents and ensuring their happiness, impacting on developmental processes.

These aspects are important to consider when understanding of developmental and systemic factors for young people engaged in university studies internationally. This research also highlights the significant vulnerability to stress and psychological distress, promoting a clear call for researchers to gain a better understanding of this population and how to best to promote adaptive transtion. Chapter 2, Study 1 examined the similarities and differences among students studying in Australia, USA and Hong Kong. When considering resilience, mental health, and SAE of students in these regions it is important to consider the complex contextual factors unique to young people in the different regions, whilst also acknowledging the common challenges associated with this life stage. Below is a review of resilience.

Understanding Resilience

The importance of understanding and promoting EA university student stress-resilience and response capacity to challenging situation includes fostering self-regulation of the ANS via effective cognitive coping and resiliency skills. With the increasing rates of young people attending university experiencing stress and psychological distress

internationally, educators are turning to researchers for a deeper understanding of this developmental phase as well as health promotion interventions to decrease stress and promote resilience (Delany et al., 2015; Regehr et al., 2012; Shiralkar & Harris, 2013). Previous researchers have also begun examining the relationships between perceived stress, psychological distress and resilience in young people and what factors impact on resilience (e.g., Pidgeon et al., 2014; Steinhardt & Dolbier, 2008; Storrie et al., 2010). These studies have reported a significant relationship between resilience, psychological distress, and perceived stress among university student populations and the importance of students having high resilience levels to navigate this important developmental stage.

However, with increasing rates of psychological distress in this population, further research is needed examining EA university students from different regions. This will increase understanding of mental health and resilience in these locations and promote understanding of the unique complex contextual factors relevant to young people transitioning to university.

Definitions of Resilience

The experience of stress and suffering is common to the human experience, with most individuals inevitably experiencing a significant stressor, loss, or trauma throughout their lifetime (Tedeschi & Blevins, 2015). In response to these common experiences, psychologists and researchers have traditionally focused on a deficit-based model of psychological functioning with an emphasis on "fixing" the symptoms and the problems associated with stressful and traumatic life events (Bonanno, 2004; Hart et al., 2006; White et al., 2008). However, recent developments in the resiliency field have begun conceptualising resilience by examining the psychological, neurobiological and physiological mechanisms associated with stress-resilience (Buckley et al., 2018; McAdam-Crisp, 2006; Ogden & Goldstein, 2017; Ogden et al., 2006). This focus has begun encouraging the inclusion of a positive psychological perspective, emphasising the modifiable nature of resilience and the potential to perceive benefits and demonstrate emotional growth through stressful life experiences (Newman, 2005; Seigel, 2010; White et al., 2008). The consensus around the modifiable nature of resilience also indicates the need for an ongoing process of replenishing resilience levels, as resiliency resources may fluctuate over time (Conner & Davidson, 2003).

A review of the literature suggests a lack of consensus regarding a definition of what mind-body resilience really is. Whilst a universal definition does not exist, contemporary research agrees that resilience is a learned process resulting from a complex combination of

cognitive, emotional, physiological and social processes; and not an inherent, immovable trait specific to individuals (Campbell-Sills et al., 2006; Leppin et al., 2014; White et al., 2008). For example, Connor and Davidson (2003) identified resilience as personal qualities that enable individuals to flourish in the face of adversity, whilst Richardson (2002) described resilience as an internal motivational force that drives wisdom seeking, self-actualization, altruism, and spiritual peace.

Numerous researchers have defined resilience as a dynamic process which includes exposure to stress and adversity, and positive adaptation despite interferences within the developmental process (Lightsey et al., 2006). In fact, numerous studies support exposure to moderate amounts of adversity and stress as actually associated with increased resilience (Luthar et al., 2000).

Broadly speaking, resilience can be described as the ability of an individual to "bounce back" in response to such adversity and/or perceived stressful circumstances in a timely way such that psychophysiological resources are conserved (Haase et al., 2016; Resnick et al., 2011; Tugade & Fredrickson, 2004; Whitson et al., 2016). Resilience is considered a dynamic and contextual construct, requiring (a) presence of threat to development, and (b) adaptation to threat judged as "good," in the sense the individual can either engender a positive outcome or minimize/avoid negative consequences (Masten, 2019; Masten & Motti-Stefanidi, 2020). Therefore, resilience has been defined as the ability of individuals to absorb life's challenges and to carry on and persevere in the face of adversity; reflecting characteristics of toughness, flexibility/elasticity and the ability to recover (Leppin et al., 2014).

Other theories consider the construct as an individual's capacity to adapt and recover from stressful events, with increased knowledge and cognitive coping capacity which can be utilised in future stress (Flach, 1989; Hanley et al., 2017). Flach's (1989) Theory of Resilience, suggests that the construct is comprised of psychological strengths necessary for successful adaption to change. This theory postulates that distress associated with stressful circumstances is an essential component for the development of adaptive coping, where temporary challenges provide opportunities to: reappraise the situation from a different perspective, process negative emotions, discover new coping mechanisms, and adjust life perspectives (Flach, 1989). Buckley et al., (2018) suggest resilience may be comprised of qualities such as resourcefulness, humour, compassion, gratitude, acceptance, self-awareness and post traumatic growth, and is both innate and learned.

Resilience: A Mind-Body Perspective

Psychological perspectives consider the stress response as being cognitively mediated, where self-awareness and adaptive cognitive skills including adaptive meaning making are considered as essential to a resilient stress response. Self-regulation has also been identified as an important component of resilience and is a concept that can be viewed both as a set of psychological skills and resources as well as a physiological process. Mind-body resilience is an embodied process, shaped largely by past habitual response patterns which "play out" in present moments (Ogden, 2017).

Buckley et al., (2018) suggests that resilience is largely centred on prediction (future anticipations), as the mind-body prepares subconsciously; anticipating whether a stimuli/event/stressor will likely cause pleasure or pain. These future predictions are habitual in nature and reflect repeated experiences of the past (Buckley et al., 2018). By examining both interoceptive and exteroceptive systems in the body, recent studies of emotionality highlight the predictive quality of all perceptual experience, where sensory and motor pathways converge with emotions and five sense perception (Barrett, 2017; Ogden, 2017). Barrett's (2017) study into emotion construction highlights an absence of emotional "blueprints" waiting to be activated, but instead, somatic, emotional and cognitive habits are largely based on earlier predictive defence strategies.

Theories such as Polyvagal Theory (PVT; Porges, 2001; 2007; 2009; 2011) suggest the functioning of the ANS, lies at the heart of the capacity to adaptively navigate life's transition points, stressors, and traumatic events. The ANS is directly shaped by both internal and external events, where experiences of significant stress or distress and experiences of care of nourishment impact autonomic (vagal) tone (Dana, 2018). Aspects such as unresolved trauma or developmental injury inhibits predictive accuracy by overlaying earlier neural firing patterns into the present (Buckly et al., 2018). These ANS responses often remain subconscious and out of awareness, being based on outdated habitual defences which remain active long after the originally triggering events have ended (Buckley).

The Hierarchy of Response (Porges, 2003; 2007; 2009) shows the movement states of the ANS. The moment an individual moves between states, is directly affected by both individual and environmental variables (Williamson et al., 2016). Dana (2018) suggests our autonomic profile falls along a continuum from sensitive and ridged, to resilient and flexible. Table 1 below summaries these components of what comprises a resilient nervous system. Dana (2018) contends that autonomic flexibility can be shaped and enhanced over time –

increasing resilience. Various breath and mindfulness meditation strategies have been associated with increased autonomic flexibility and resilience (Dana, 2018). Table 1 presents a summary of the continuum of the ANS in terms of resilience below.

Table 1

Summary of the Continuum of the Autonomic Nervous System in Terms of Resilience (summarised from Dana, 2018)

Autonomic Nervous System (ANS) State Profile	Function	Response Patterns
Sensitive and Rigid	ANS is tuned towards danger and drives towards protection	- Hypervigilance - Heighted startle response - Interpretation of neural cues as dangerous - Failure to recognise cues of safety
Resilient and Flexible	ANS is tuned towards patterns of connection	- Urge to safely connect and be in relationship - Adaptive patterns of social connection - Flexible transitions in response to the demands of the present moment

Resilience in the Emerging Adult University Student

The most effective way to comprehensively understand resilience is to study this construct within specific developmental periods (Plocha & Bacigalupe, 2020; Rutter, 2007). The EA's thoughts, feelings and behaviours reveal underlying physiological and neurological development unique to this age period (Furlong, 2009). During childhood and adolescence, the amygdala (the primary emotion centre of the brain) is responsible for decision making, resulting in behaviour driven by strong emotional impulses (Siegel, 2010). As the prefrontal cortex (PFC)grows, reasoning abilities are increased. Adolescents only have partial PFC dominance developed, meaning reasoning can be accessed when life is calm and become emotionally flooded in the face of multiple stimuli and stressors (Seigel). Whilst capacity for complex decision-making increases during EA through eventual full development of the PFC, EAs are still vulnerable to emotional flooding during times of change and stress.

Specifically compared to adults, EAs differ regarding the processing of socio-emotional stimuli, where selectivity and reactivity to stressors are heightened (Sneed et al., 2007). In cognitive studies, this is demonstrated in differences in the activation of the PFC (Furlong, 2009). The PFC – the brain's centre for reasoning and problem solving - develops fully during EA via pruning of grey matter and an increase in white matter (Tanner, 2006). The plasticity of the EA's brain indicates that maturation remains sensitive to the environmental conditions and experiences during these years, and that the opportunity to enhance adaptive capacities associated with activating the PFC, and reducing the experience of chronic stress, is salient to understanding the role of EA in lifespan human development (Siegel, 2010).

This suggests EAs' increased sensitivity to stressful stimuli is a function of brain maturation; with age comes greater PFC developmental, self-regulation and greater opportunity to reframe emotional reactions with cognitive interpretations that are more positive (Williams et al., 2006). However, Polyvagal Theory also suggests that response patterns of the ANS are shaped via early attachment and environmental experiences and can persist over time (Dana, 2018). As EAs enter the first life cycle transition and launch from the family home, they encounter a variety of potential stressors and embark on a range of unique developmental tasks as they move towards adulthood. At this point, the habitual response patterns of the ANS are likely to emerge, providing important information on whether the individual's autonomic profile is sensitive and rigid or resilient and flexible. Furthermore, both modelled and habitual cognitive coping strategies in relationship to change and potential stressors will be evident, highlighting resilience and meaning making biases in terms of such events.

Research Aims and Hypotheses

Study 1 was conducted to investigate the role of resilience in the prevention of psychological distress among EA university students studying in three different higher education institutions around the world; Australia (Bond University), USA (University of Florida) and Hong Kong (Hong Kong University). Based on previous research in the field of perceived stress, resilience, and psychological distress pertaining to EAs engaged in university education, the present study had two main aims. Firstly, this study aimed to investigate the relationships between perceived stress, resilience, psychological distress, and SAE in EAs currently engaged in university studies from Australia, Hong Kong and USA. The use of such samples assists to similarities and difference between EA university students in terms of resilience, perceived stress, psychological distress, and SAE in these locations.

Secondly, this study aimed to extend current literature pertaining to EAs by investigating how perceived stress impacts psychological distress via analysing the potential moderating effect of resilience and satisfaction with academic experience. Given the ongoing need for effective research pertaining to EAs, this study aimed to provide a clear understanding of the role of resilience in stress prevention within this population. Therefore, the following hypotheses were developed:

1. Hypothesis 1: EA students studying in Hong Kong would report significantly higher perceived stress and psychological distress, and significantly lower resilience and SAE compared to students studying in Australia and USA.
2. Hypothesis 2: Significant differences were predicted between EA university students depending on resilience levels (i.e., based on cut-off scores for Resilience Scale - 25 Item: very low, low, moderate, high, and very high) across all indicators of psychological distress measured with the DASS 21 (i.e., total score, and the stress, anxiety, and depression subscales), as well as measures of perceived stress and satisfaction with academic experience.
3. Hypothesis 3: Higher perceived stress would positively predict psychological distress in EA university students (i.e., total DASS score, and the stress, anxiety, and depression subscales separately).
4. Hypothesis 4: Higher satisfaction with academic experience would negatively predict measures of psychological distress in EA university students (i.e., total DASS score, and the stress, anxiety, and depression subscales separately).
5. Hypothesis 5: Higher resilience scores would negatively predict measures psychological distress in EA university students (i.e., total DASS score, and the stress, anxiety, and depression subscales separately).
6. Hypothesis 6: Higher Resilience would moderate the relationship between perceived stress and psychological distress among EA university students.
7. Hypothesis 7: Higher Satisfaction with academic experience would moderate the relationship between perceived stress and psychological distress among EA university students.
8. Hypothesis 8: Higher resilience would mediate the relationship between perceived stress and psychological distress.

Method

Participants

The current study employed a non-probability, convenience sampling method to collect self-report data with a response rate of 68%. The sample was comprised of university students from Bond University in Australia, The University of Hong Kong, and The University of Florida. All participants included in the study spoke fluent English. Entry to The University of Hong Kong requires a high level of English proficiency and all classes are taught in English. Participants were recruited from The University of Hong Kong via student research participant pools and through advertisement on online research sites. Participants from The University of Florida were recruited through posting copies of the explanatory statement around common areas of the campus. Participants from Bond University were recruited via the research participant pool, direct approach and marketing via the university notice boards.

The inclusion criteria for the current study specified participants were a minimum of 18 years old and maximum 29 years enrolled in tertiary studies at Bond University, The University of Hong Kong, or The University of Florida (N=221). Participation in the study was voluntary and participants were advised they could withdraw at any time without penalty. Bond University undergraduate psychology students were reward with one credit point for participation in the study. The current study was part of a collaborative research project. Researchers liaised with the University of Hong Kong and the University of Florida to facilitate recruitment of participants across the three universities. Demographic information for participants is displayed below in Table 2.

A priori power analysis for MANOVA using G*Power (Faul, Erdelder, Lang, & Buchner, 2007) was performed to ensure an adequate sample size. G*Power Analysis required a sample of N = 21 to detect a large effect size based on the number of included predictors (3), thus sample size was appropriate even with the removed cases ($N = 221$). Table 2 below shows the sample characteristics.

Table 2

Sample Characteristics (N=221, M_{age} = 20.71, SD_{age}=2.19)

		Count	Layer N %
Gender (N=207)	Male	27	12
	Female	180	81
	other	0	0.0
Region (N=221)	Australia	105	47.5
	USA	55	24.9
	Hong Kong	61	27.6
Year of Enrollment (N=105)	Undergraduate 1st Year	36	34.3
	Undergraduate 2nd Year	24	22.9
	Undergraduate 3rd Year	38	36.2
	Undergraduate 4th Year	6	5.7
	Postgraduate Degree	1	1
Living (N=189)	Off-campus	52	23.5
	Parents' home	32	14.5
	Residence hall	60	27.1
	Relative's home	45	20.4
	Other	6	2.9
Status (N=105)	Domestic	61	58.1
	International	44	41.9

Materials

The questionnaire package included the following: Consent Form and Explanatory Statement, Demographic Questionnaire, Perceived Stress Scale (PSS; Cohen, Kamarck, & Mermelstein, 1983); The Depression Scale and Anxiety Scale (DASS-21; Lovibond & Lovibond, 1995); The Resilience Scale (RS; Wagnild & Young, 1993) and The Satisfaction with Academic Experience Subscale (SAES; Nora, 2004). The questionnaire was administered online via the secure online survey program Survey Monkey (see Appendix D and G).

Demographic Questionnaire

Demographic information was obtained regarding gender, age, university location, year of study, current degree, student status, enrolment status and living circumstances.

Perceived Stress Scale (Cohen, Kamarck & Mermelstein, 1983)

The PSS is a 10-item self-report questionnaire assessing the extent an individual appraises life events as stressful within the last week (Cohen et al., 1983; Lavoie & Douglas, 2012). Participants respond to items on a 5-point Likert-type scale ranging from 0 = (never) to 5 = (very often. A total perceived stress score is obtained by summing answers, with scores ranging from a low of 0 to a theoretical high of 50; where higher scores indicate higher levels of perceived stress. Sample items include "in the last month, how often have you felt you could not cope with all the things you had to do?" and "in the last month how often have you felt nervous or stressed?"

The scale has been developed for use in community samples and has been normed on 3000 adults from the general population in North America and is recommended for use in individuals with a minimum secondary school level education (Lavoie & Douglas, 2012). The PSS is utilised internationally as the most widely used psychological instrument for measuring perceptions of stress (Lavoie, & Douglas). Sound psychometric properties have been demonstrated for the measure, including high reliability (Cronbach's $\alpha = .93$) and validity of the PSS (Kalaldeh & Shosha, 2012). The mean value of Cronbach's α in the current study was .72.

The Depression Anxiety Stress Scale (Lovibond & Lovibond, 1995)

The DASS-21 is a 21-item self-report questionnaire assessing symptoms related to the negative emotional states of depression, anxiety, and stress in both clinical and non-clinical populations aged 12 years and above (Lovibond & Lovibond, 1995). The 7-item depression scale assesses inertia, dysphoria, devaluation of life, hopelessness, self-deprecation and anhedonia. The 7-item anxiety scale measures autonomic arousal, anxious affect, situational anxiety and skeletal muscle effects. The 7-item stress scale measures chronic levels of arousal related to stress. Respondents are required to answer each item in terms of how often it has applied to them during the previous week. Each item is using a 4-point Likert-type scale ranging from 0 = (did not apply to me at all) to 3 = (applied to me very much or most of the time). Scores for each scale are calculated through the summation of items and their multiplication with 2 and range from 0 to 42 for each subscale. Higher scores indicate higher psychological distress. There are five categories relating to severity, ranging from normal to extremely severe

(Lovibond & Lovibond, 1995). Sample items include “I find it hard to wind down,” “I felt I had nothing to look froward to” and “I felt I was close to panic.”

Research has established the DASS-21 as a reliable and valid measure of depressive, anxiety and stress symptoms (Antony et al., 1998). Henry and Crawford (2005) established strong internal consistency of the DASS-21 in a sample of 1,794 adults from the general British population, as evidenced by the Cronbach's α = .82 for the depression scale and α = .90 for the anxiety scale. Construct validity has also been established with confirmatory factor modelling revealing the hypothesised three factors structure was an optimal fit to the model, demonstrating the DASS-21 as comprised of the psychological constructs of depression, anxiety and stress (Sinclair et al., 2012). The mean values of Cronbach’s α in the current study ranged from .53 to .79, with depression scale having lowest reliability .53.

The Resilience Scale (Wagnild & Young, 1993; Wagnild, 2009)

The RS-25 is a 25-item scale measuring the degree of individual resilience, with the author’s describing the scale as a potential measure of internal resources and of the positive contribution of what one brings to a difficult life event (Wagnild & Young, 1993). Each item is measured using a 7-point Likert-type scale ranging from 1 = (strongly disagree) to 7 = (strongly agree). The scale measures five core domains of resilience, including equanimity, perseverance, self-reliance, meaningfulness, and existential aloneness. Sample items include “I usually take things in my stride” and “My belief in myself gets me through the hard times.” According to Wagnild (2009), the scores can be divided into the following profiles: 14-30 represents a very low level of resilience; 31-48 represents a low level of resilience; 49-63 represents an average level of resilience; 64-81 represents a high level of resilience; and 82-98 represents a very high level of resilience.

Psychometric evaluation supports the reliability and concurrent validity of the scale (Wagnild & Young, 1993). Assessment of psychometric properties of the RS-25 showed Cronbach’s α coefficients between .89 and .92 across different ethnic samples (Pritzker & Minter, 2014; Wagnild, 2009; Zelviene et al., 2021). This scale shows high reliability in this study as well, with Cronbach’s α value .91 for the total scale. Although initially developed and tested with adults, the Resilience Scale (RS-25; Wagnild & Young, 1993) has been used in a variety of adult populations (Christopher, 2000; Heilemann et al., 2003; Humphreys, 2003) as well as with adolescents, with numerous studies validating the scale with various age groups and diverse ethnicities (Chen et al., 2020; Hunter & Chandler, 1999; Konaszewski et al., 2021,

Surzykiewicz et al., 2019). The RS-25 has been translated and psychometrically tested in other languages.

The Satisfaction with Academic Experience Subscale (Nora, 2004)

The 5-item Satisfaction with Academic Experience subscale (SAES) forms part of the larger Survey of Student Attitudes and Behaviours Influencing College Choice (Nora, 2004). The subscale is a measure of student satisfaction with academic experience, and assesses satisfaction with classroom experiences, interactions with staff and preparation for the future based on personal expectations (Nora, 2004). Students are asked to rate the degree to which they agree or disagree with statements that reflect their level of satisfaction with their academic experience using a 5-point Likert-type scale ranging from 1 = (strongly disagree) to 5 = (strongly agree). Scores on the SAES range from 5 to 25, with higher scores indicating higher satisfaction with academic experience. Sample items include "My classes are what I expected in terms of their difficulty" and "I believe this university will prepare me to succeed." The SAES has demonstrated sound psychometric properties, with Cronbach's α coefficients ranging from .77 to .82 (Nora, 2004). Internal consistency Cronbach's α value for the current study included .79 for the total scale. Table 3 contains the mean, standard deviation, normality and reliability of scales used.

Table 3

Mean, Standard Deviation, Normality and Reliability of Scales

Scale	Min	Max	M	SD	Sk	Ku	α
DASS-21 Total Score	0	74	28.72	16.71	0.50	-0.27	0.79
DASS-21 Stress	0	28	9.99	6.64	0.45	-0.59	0.78
DASS-21 Anxiety	0	26	7.24	6.17	0.97	0.41	0.73
DASS-21 Depression	0	32	11.49	8.72	0.29	-1.03	0.69
PSS Total score	4	35	19.50	5.14	-0.58	1.16	0.72
SAE Total score	7	25	19.16	3.75	-0.61	0.24	0.79
RS Total Score	81	172	134.14	18.16	-0.22	-0.25	0.91

Note. N = 221. Min – minimum score; Max – maximum score; M – mean; SD – standard deviation; Sk – skewness; Ku – kurtosis; α – Cronbach's alpha coefficient of internal consistency

Procedure

Ethical approval was obtained from Bond University Human Research and Ethics Committee (BUHREC) for the current study and was designed in accordance with the National Health and Medical Research Council (NHMRC) National Statement on Ethical Conduct in Human Research. Participants in Australia were recruited via advertisements on the Bond University research board and participant pool. Bond University psychology students were offered a course credit of 1% for their participation. Participants from the University of Florida and University of Hong Kong were recruited through methods of advertising, by placing the Explanatory Statement via their university's research participant pool. The web-based questionnaire link was distributed to participants electronically and accessed securely online via Survey Monkey. All participation was considered voluntary, with informed consent being obtained electronically on the first page of the questionnaire. The informed consent process contained the Explanatory Statement, including information assuring response confidentiality. All information collected was anonymous, with no identifying participant information obtained. The questionnaire took approximately 30 minutes to complete.

Data Analysis

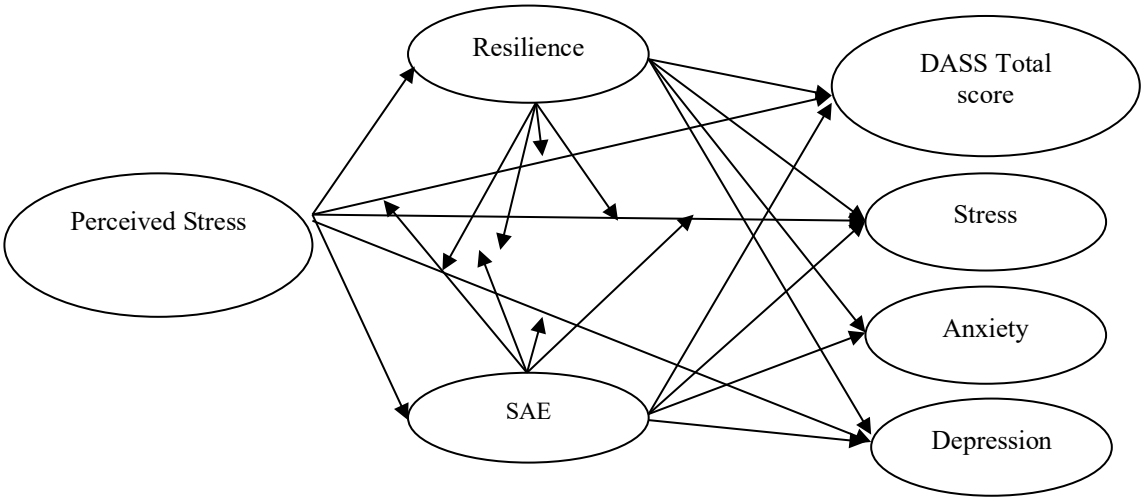
Data were analysed using IBM SPSS Statistics (Version 21). Demographic characteristics of the sample were assessed using descriptive statistics, and relationships between perceived stress, resilience, SAE and psychological distress were determined with bivariate correlations. A two-way MANOVA was conducted in order to examine differences between participants' levels of resilience (i.e., based on RS-25 cut-off scores; very low, moderate, high and very high) in all measures of psychological distress, perceived stress and SAE.

Multiple regressions were conducted to determine the predictive contribution of perceived stress, resilience, and SAE in psychological distress scores within this EA university students studying in the regions. Thus, based on the results of multiple regression, resilience and SAE were analysed as potential moderators and mediators of the relationship between measures of perceived stress and psychological distress. Both moderation and mediation analyses were performed using the PROCESS macro for SPSS (models 1 and 6; Hayes, 2013) in order to assess moderating and mediating effect of resilience and SAE in this sample. Mediation analyses were performed using 5000 bootstrap samples and bias-corrected methods to assess indirect effects of resilience and SAE on the total effect of perceived stress on

psychological distress. Figure 2 below shows the mediation and moderation model and corresponding hypothesised relationships.

Figure 2

Hypothesised Mediation and Moderation Model



Note. Mediation and Moderation Model of Perceived Stress, Resilience, Satisfaction with Academic Experience and Psychological Distress.

Results

Results from bivariate correlations between measured constructs are presented in Table 4 below. Perceived stress was positively and moderately correlated with all subscales of psychological distress ($p < .01$), and negatively correlated with resilience ($r = -.46$, $p < .01$). Resilience was found to be negatively associated with all subscales of psychological distress ($p < .01$), and positively correlated with satisfaction with academic experience (SAE; $r = .30$, $p < .01$). Lastly, SAE was negatively correlated with DASS 21 total score ($r = -.15$, $p < .01$) and anxiety subscale ($r = -.19$, $p < .01$), and positively correlated with resilience ($r = .31$, $p < .01$).

Table 4

Correlations Between Measured Constructs

Scale	1	2	3	4	5	6
1. DASS 21 Total Score	-					
2. DASS 21 Stress	.73**	-				
3. DASS 21 Anxiety	.84**	.61**	-			
4. DASS 21 Depression	.77**	.22**	.43**	-		
5. PSS Total score	.58**	.43**	.44**	.48**	-	
6. SAE Total score	-.15*	-.11	-.19**	-.00	-.01	-
7. RS Total Score	-.46**	-.30**	-.50**	-.30**	-.37**	.31**

*Note. **p < .01; *p < .05*

Differences in mean scores between participants from different regions are presented below in Table 5. Differences in mean scores were shown for all measured constructs, excluding the DASS-21 anxiety subscale. With regards to psychological distress, EA university students in Australia reported significantly lower scores on the DASS-21 total score and depression subscale ($p < .01$) as well as lower perceived stress scores, compared to students from USA and Hong Kong. However, participants from USA reported significantly lower scores on the stress subscale score of the DASS-21 compared to participants in other regions. Finally compared to participants in Australia and USA, participants from Hong Kong reported significantly lower resilience and SAE scores.

Due to significant differences in perceived stress, psychological distress, resilience and SAE scores between participants in different regions, university was included in MANOVA as

an independent variable to examine the potential interaction between university and resilience levels.

Table 5

Differences Between Emerging Adult University Students from Difference Regions

	USA (M, SD)	Hong Kong (M, SD)	Australia (M, SD)	F (df)
DASS-21 Total	34.14 (15.2)	33.61 (16.53)	23.4 (15.97)**	12.75 (2, 233)*
DASS-21 Stress	7.21 (6.07)**	10.65 (6.58)	11.03 (6.60)	7.19 (2, 233)*
DASS-21 Anxiety	7.52 (6.04)	8.32 (6.40)	6.51 (6.07)	1.82 (2, 233)
DASS-21 Depression	19.41 (5.94)	14.65 (7.12)	5.84 (6.46)**	93.36 (2, 233)*
Perceived Stress	20.83 (2.7)	21.20 (3.83)	17.92 (6.14)**	11.81 (2, 233)*
SAE Total	20.14 (3.91)	17.06 (3.02)**	19.78 (3.62)	14.79 (2, 233)*
Resilience Total	136.71 (18.96)	127.08 (15.88)**	136.62 (18.05)	6.65 (2, 233)*

Note. $*p < .01;$ **significant differences in mean scores as suggested by Scheffe post-hoc test. M – mean; SD – standard deviation; F – F-statistic; df – degrees of freedom

Differences in Psychological Distress, Perceived Stress and Satisfaction with Academic Experience Based on Resilience and University

The results of the two-way MANOVA examining resilience (i.e., RS-25 recommended cut-off levels; very low, low, moderate, high, and very high) and University (i.e., Australia, Hong Kong, and USA), and the dependant variables of psychological distress (DASS-21 total score, stress, anxiety, and depression subscales) showed a statistically significant difference in measures of psychological distress based on resilience level, $F (12, 542.67) = 5.69$, $p < .001$; Wilk's $\Lambda = .73$, partial $\eta^2 = .10$ and university, $F (6, 410) = 30.62$, $p < .001$; Wilk's $\Lambda = .48$, partial $\eta^2 = .31$. Their interaction, however, was not statistically significant, $F (21, 589.19) = <1$; Wilk's $\Lambda = .92$, partial $\eta^2 = .03$.

Univariate tests showed that there were significant differences across resilience on total measure of psychological distress, $F (4, 207) = 10.51$; $p < .001$; partial $\eta^2 = .17$, stress subscale, $F (4, 207) = 4.64$; $p < .001$; partial $\eta^2 = .08$, anxiety subscale $F (4, 207) = 16.05$; $p < .001$; partial $\eta^2 = .24$, and depression subscale, $F (4, 207) = 4.57$; $p < .001$; partial $\eta^2 = .08$. Notably, participants with lower levels of resilience reported higher levels of psychological distress.

Table 6

Differences Across Resilience Scores on Measures of Psychological Distress

Resilience levels → (M and SD)	Very High (N=50)	High (N=15)	Moderate (N=58)	Low [1] (N=68)	Very Low[2] (N=30
DASS 21-Total	19.47 (8.99)[1, 2]	19.24 (13.42)[1, 2]	28.48 (18.54)[2]	33.23 (14.13)	42.4 (15.77)
DASS 21-Stress	7.33 (6.70)	7.52 (5.86)[1, 2]	9.41 (7.28)	11.71 (6.34)	12.81 (6.35)
DASS 21-Anxiety	3.07 (3.76)[1, 2]	3.76 (3.41)[1, 2]	7.55 (6.57)[2]	8.21 (5.13)[2]	13.73 (6.96)
DASS 21-Depression	9.07 (7.85)[2]	7.96 (8.51)[1, 2]	11.52 (9.49)	13.32 (7.85)	15.86 (7.25)

Note. Values represent means and standard deviations. Superscripts 1 and 2 represent significant differences between different levels of resilience in measures of psychological distress as indicated by Scheffe post-hoc test.

The results of one-way MANOVA examining resilience levels (i.e., very low, low, moderate, high, and very high) and dependant variables of perceived stress and satisfaction with academic experience (SAE), showed statistically significant differences based on resilience level, $F (8, 430) = 7.89$, $p < .001$; Wilk's $\Lambda = .76$, partial $\eta^2 = .13$. Univariate tests showed significant differences across resilience levels for perceived stress, $F (4, 216) = 11.32$; $p < .001$; partial $\eta^2 = .17$) and SAE, $F (4, 216) = 5.27$; $p < .001$; partial $\eta^2 = .09$. Participants with higher levels of resilience reported lower scores of perceived stress and higher SAE compared to participants with lower levels of resilience (Table 7).

Table 7

Differences in Resilience Scores on Perceived Stress and Satisfaction with Academic Experience

Resilience levels → (M and SD)	Very high	High	Moderate[3]	Low[1]	Very Low[2]
Perceived Stress	16.67 (4.33) [1, 2]	16.42 (5.86) [1, 2, 3]	19.95 (5.09)	21.34 (3.92)	21.67 (2.57)
Satisfaction with Academic Experience	21.67 (3.43) [1, 2]	20.12 (3.60) [1]	19.28 (3.59)	18 (3.53)	18 (3.68)

Note. Values represent means and standard deviations. Superscripts 1 and 2 represent significant differences between different levels of resilience in measures perceived stress and satisfaction with academic expectations as indicated by Scheffe post-hoc test.

Mediation and Moderation Model: Predicting Psychological Distress

The results of multiple regression analyses are presented in Table 8. Firstly, as region was a categorical variable with three levels (Hong Kong, Australia and USA), this was converted into two Dummy Variables. Specifically, Hong Kong was coded as 0, whilst Australia was coded as 1. USA was observed as the referencing group.

In the first step of the multiple regression model with psychological distress (DASS-21 total score) as criterion, perceived stress ($\beta = .48$, $p < .01$) and resilience ($\beta = -.27$, $p < .01$) were statistically significant predictors of psychological distress. In the second step region was shown as a significant predictor of psychological distress ($\beta = -.18$, $p < .01$; students from Australia when compared to students studying in USA). These predictors explained approximately 43% of variance. In the first step of the multiple regression model with DASS-21 Stress Subscale scores as criterion, perceived stress ($\beta = .38$, $p < .01$) and resilience ($\beta = -.16$, $p < .01$) were also statistically significant predictors, followed by Hong Kong ($\beta = .17$, $p < .01$) and Australia ($\beta = .42$, $p < .01$) in the second step, explaining approximately 33% of variance.

In the prediction of DASS-21 anxiety subscale scores, perceived stress ($\beta = .29$, $p < .01$) and resilience ($\beta = -.38$, $p < .01$) were statistically significant predictors, explaining approximately 33% of variance. Lastly, perceived stress ($\beta = .43$, $p < .01$) and resilience ($\beta = -.14$, $p < .01$) were statistically significant predictors of variance in DASS-21 depression subscale scores in the first step, followed by Hong Kong ($\beta = -.29$, $p < .01$) and Australia ($\beta = -.69$, $p < .01$) in the second step. These predictors explained approximately 55% of the variance

in DASS-21 depression subscale scores.

Satisfaction with academic experience (SAE) was not a significant predictor of psychological distress (i.e., both DASS-21 total and DASS-21 subscale scores separately) and was excluded from subsequent moderation and mediation analyses.

Table 8

Prediction of Psychological Distress (Depression Anxiety Stress Scale Total Score and Stress, Anxiety and Depression Subscales Separately)

	DASS-21 Total		Stress Subscale		Anxiety Subscale		Depression Subscale	
	B (β)	SE	B (β)	SE	B (β)	SE	B (β)	SE
Perceived Stress	1.61 (.48)*	0.19	0.51 (.38)*	0.09	0.36 (.29)*	0.07	0.74 (.43)*	0.11
SAE	-0.11 (-.02)	0.25	-0.04 (-.02)	0.12	-0.08 (-.05)	0.10	0.02 (.01)	0.15
Resilience	-0.25 (-.27)*	0.06	-0.06 (-.16)*	0.03	-0.13 (-.38)*	0.02	-0.07 (-.14)**	0.03
	F(3, 217)=50.08, p<.001 R=.64, R^2=.41, R^2change=.41		F(3, 217)=19.57, p<.001 R=.46, R^2=.21, R^2change=.21		F(3, 217)=35.0, p<.001 R=.57, R^2=.33, R^2change=.33		F(3, 217)=23.72, p<.001 R=.49, R^2=.25, R^2change=.25	
Perceived Stress	1.47 (.44)*	0.19	0.64 (.48)*	0.08	-	-	0.45 (.26)*	0.09
SAE	-0.14 (-.03)	0.26	-0.05 (-.03)	0.11	-	-	0.04 (.02)	0.12
Resilience	-0.27 (-.29)*	0.05	-0.04 (-.12)*	0.02	-	-	-0.09 (.18)*	0.03
Hong Kong	-4.14 (-.11)	2.52	2.56 (.17)*	1.10	-	-	-5.71 (-.29)*	1.16
Australia	-6.19 (-.18)*	2.23	5.71 (.42)*	0.97	-	-	-12.08 (-.69)*	1.02
	F(5, 215)=32.40, p<.001 R=.66, R^2=.43, R^2change=.02		F(5, 215)=20.82, p<.001 R=.57, R^2=.33, R^2change=.12		-		F(5, 215)=52.47, p<.001 R=.74, R^2=.55, R^2change=.30	

Note. N = 221 **p < .01, **p < .05;* B – unstandardised regression coefficients; β – standardised regression coefficients; SE – standard error; R – correlation coefficient; R^2 – determination coefficient; PSS – perceived stress; SAE – satisfaction with academic experience; RS – resilience

Moderating Effects of Resilience on Psychological Distress

Results of moderation analysis (Table 9) with psychological distress (DASS-21 total) as criterion did not show a significant moderation effect on resilience (p>.05).

Table 9

Moderating Effect of Resilience

			CI 95%	
	B	SE	Lower	Upper
Perceived stress	1.68*	.20	26.80	30.63
Resilience	-.25*	.05	1.28	2.08
Perceived stress * Resilience	-.01	.01	-.03	.01
$F(3, 217) = 50.53, p < .001$				
$R = .64, R^2 = .41$				

Note. B – unstandardised regression coefficient; SE – standard error; CI – confidence intervals; R – correlation coefficient; R^2 – determination coefficient. Criterion: psychological distress

A significant interaction was observed in the prediction of measures of psychological distress when examining DASS-21 subscales separately. A significant moderation effect of resilience on the relationship between perceived stress and the DASS-21 stress subscale (Table 9) was observed. Specifically, high and moderate resilience scores demonstrated decreases in DASS-21 stress subscale scores when predicted by perceived stress (see Figure 3). Lower resilience scores resulted in a slight increase in DASS-21 stress scores for higher values of perceived stress. Region did not show a significant moderating effect on the relationship between perceived stress on psychological distress (DASS-21 total and subscale scores). Table 10 shows the moderating effects of resilience.

Table 10

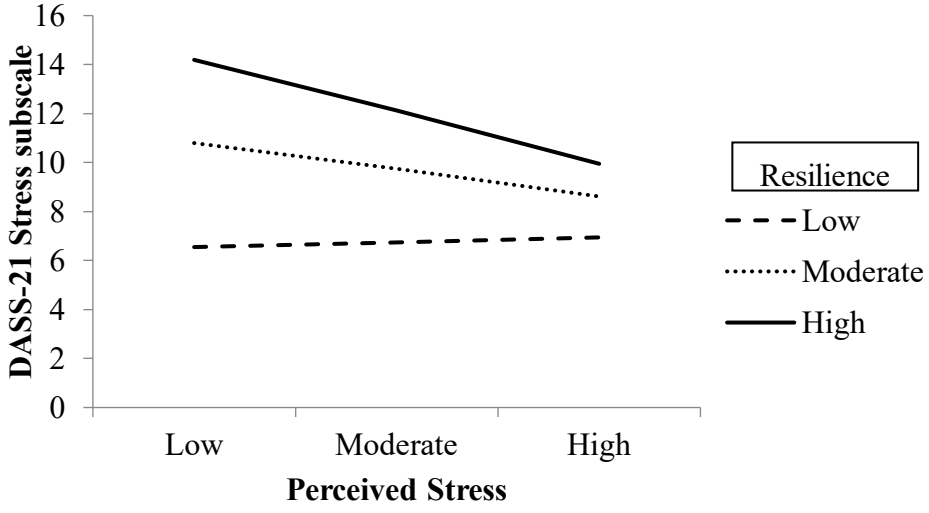
Moderating Effect of Resilience on Depression Anxiety Stress Scale Subscales

	Stress Subscale				Anxiety Subscale				Depression Subscale			
			CI				CI				CI	
	B	SE	Lower	Upper	B	SE	Lower	Upper	B	SE	Lower	Upper
Perceived Stress	.6*	.09	.42	.78	.39*	.08	.23	.55	.68*	.11	.45	.91
Resilience	-.05**	.02	.42	.78	.13*	.02	-.17	-.09	-.06*	.03	-.12	-.01
Perceived Stress * Resilience	-.01*	.00	-.02	.00	.00	.00	-.01	.00	.01	.01	.00	.02
	F(3, 217) = 22.55, p < .001 R=.48, R^2 =.24				F(3, 217) = 35.38, p < .001 R =.57, R^2 =.32				F(3, 217) = 24.33, p < .001 R =.50, R^2 = .25			

*Note. *p<.01; **p<.05;* B – unstandardised regression coefficient; SE – standard error; CI – confidence intervals; R – correlation coefficient; R^2 – determination coefficient.

Figure 3

Moderation Effect of Resilience on the DASS-21 Stress Subscale Score when Predicted by Perceived Stress



Mediation Effects: Resilience, Satisfaction with Academic Experience, and University on Perceived Stress and Psychological Distress

Resilience demonstrated a mediating effect where the indirect effect of perceived stress on psychological distress was statistically significant (Est. = .34, 95% CI 0.16 to 0.56: Table 10). These findings suggested a partial mediation, as perceived stress remained significant after the inclusion of resilience as a mediator. Findings also implied a direct, negative effect of perceived stress on resilience (Est. = -1.26, 95% CI -1.68 to − 0.84) and a total effect of perceived stress on psychological distress (Est. = 1.82, 95% CI 1.44 to 2.19). Region where participants attended university also showed a significant direct effect on resilience and satisfaction (i.e., participants from Hong Kong were significantly lower when compared to baseline group of students from USA). Table 11 shows the mediation effects of resilience and SAE.

Table 11

Mediating Effects of Resilience and Satisfaction with Academic Experience

			CI	
	Point estimates B	SE	Lower	Upper
1. Direct effect of predictor (perceived stress) on mediator (resilience)	-1.26*	.22	-1.68	- .84
2. Direct effect of predictor (perceived stress) on mediator (SAE)	-.03	.06	- .14	.07
3. Direct effect of covariate (Hong Kong) on mediator (resilience)	-5.57	3.08	-11.71	.38
4. Direct effect of covariate (Australia) on mediator (resilience)	-3.16	2.97	-9.24	2.47
5. Direct effect of covariate (Hong Kong) on mediator (SAE)	-2.84*	.66	-4.12	-1.51
6. Direct effect of covariate (Australia) on mediator (SAE)	- .46	.66	-1.73	.88
7. Direct effect of mediator (resilience) on second mediator (satisfaction)	.05*	.01	.03	.08
8. Total effect of predictor (perceived stress) on psychological distress	1.82*	.19	1.44	2.19
9. Total effect of covariate (Hong Kong) on psychological distress	-1.37	2.53	- 6.38	3.62
10. Total effect of covariate (Australia) on psychological distress	-5.14*	2.33	-9.75	-.53
11. Indirect effect of predictor (perceived stress) on psychological distress via resilience	.34*	.10	.16	.56
12. Indirect effect of predictor (perceived stress) on psychological distress via satisfaction	-.00	.02	- .05	.03
13. Indirect effect of predictor (perceived stress) on psychological distress via resilience and satisfaction	.01	.02	- .03	.05

Note. N=221; * represent statistically significant effects; CI – bootstrapped confidence intervals; Effect of resilience on psychological distress: Est. = -.26, 95% CI -0.36 to –0.16; Output variable: psychological distress in general

The obtained findings for the DASS-21 stress subscale showed significant total effects of perceived stress on the DASS-21 stress subscale (Est. = .71, 95% CI 0.55 to 0.86; Table 10), and total direct effects of university (i.e., when compared to the baseline university, USA: Hong Kong - Est. = 3.14, 95% CI 1.07 to 5.21; Australia - Est. = 5.91, 95% CI 3.99 to 7.82). No

indirect effects of perceived stress on the DASS-21 stress subscale were statistically significant, therefore the assumption that no significant mediation has occurred can be concluded.

Table 12

Mediating Effects of Resilience and Satisfaction with Academic Experience

			CI	
	Point estimates B	SE	Lower	Upper
1. Direct effect of predictor (perceived stress) on mediator (resilience)	-1.30*	.20	-1.69	- .91
2. Direct effect of predictor (perceived stress) on mediator (satisfaction)	.03	.06	- .08	.15
3. Direct effect of covariate (Hong Kong) on mediator (resilience)	-8.93*	3.19	-15.18	-2.56
4. Direct effect of covariate (Australia) on mediator (resilience)	-3.71	3.09	-9.77	2.37
5. Direct effect of covariate (Hong Kong) on mediator (SAE)	-2.36*	.63	-3.60	-1.12
6. Direct effect of covariate (Australia) on mediator (SAE)	- .26	.63	-1.48	.94
7. Direct effect of mediator (resilience) on second mediator (SAE)	.05*	.01	.03	.08
8. Total effect of predictor (perceived stress) on stress subscale	.71*	.08	.55	.86
9. Total effect of covariate (Hong Kong) on stress subscale	3.14*	1.05	1.07	5.21
10. Total effect of covariate (Australia) on stress subscale	5.91*	.97	3.99	7.82
11. Indirect effect of predictor (perceived stress) on stress subscale via resilience	.06	.03	- .01	.14
12. Indirect effect of predictor (perceived stress) on stress subscale via satisfaction	-.00	.01	- .02	.01
13. Indirect effect of predictor (perceived stress) on stress subscale via resilience and satisfaction	.00	.01	- .01	.02

Note. N=221; * represent statistically significant effects; CI – bootstrapped confidence intervals; Output variable: stress subscale

Results for the DASS-21 anxiety subscale using the bootstrap test indicated the indirect effect of perceived stress on anxiety was significant (Est. = .18, 95% CI 0.10 to 0.27), however, like psychological distress the results also showed a partial mediation (Table 13).

Table 13

Mediating Effects of Resilience and Satisfaction with Academic Experience

	Point estimates B	SE	CI Lower	CI Upper
1. Direct effect of predictor (perceived stress) on mediator (resilience)	-1.30*	.20	-1.70	- .92
2. Direct effect of predictor (perceived stress) on mediator (SAE)	.03	.06	- .08	.15
3. Direct effect of covariate (Hong Kong) on mediator (resilience)	-8.93*	3.19	-15.27	-2.70
4. Direct effect of covariate (Australia) on mediator (resilience)	-3.71	3.04	-9.83	2.20
5. Direct effect of covariate (Hong Kong) on mediator (SAE)	-2.36*	.62	-3.58	-1.13
6. Direct effect of covariate (Australia) on mediator (SAE)	- .26	.63	-1.56	.99
7. Direct effect of mediator (resilience) on second mediator (SAE)	.05*	.01	.03	.08
8. Total effect of predictor (perceived stress) on anxiety	.55*	.07	.39	.71
9. Total effect of covariate (Hong Kong) on anxiety	.53	1.05	-1.54	2.60
10. Total effect of covariate (Australia) on anxiety	.72	.96	-1.19	2.63
11. Indirect effect of predictor (perceived stress) on anxiety via resilience	.18*	.04	.10	.27
12. Indirect effect of predictor (perceived stress) on anxiety via satisfaction	-.00	.01	- .03	.02
13. Indirect effect of predictor (perceived stress) on anxiety via resilience and satisfaction	.01	.01	- .01	.03

Note. N=221; * represent statistically significant effects; CI – bootstrapped confidence intervals; Effect of resilience on anxiety: Est. = -.13, 95% CI -0.17 to – 0.09; Output variable: anxiety subscale

Finally, results for the DASS-21 depression subscale showed resilience demonstrated a mediating effect, where the indirect effect of perceived stress on depression was statistically significant (Est. = .11, 95% CI 0.03 to 0.19: Table 13). However, again these results suggest partial mediation occurred. Furthermore, like the DASS-21 stress subscale, the total direct effects of university (i.e., when compared to the baseline university, USA: Hong Kong - Est. = -5.05, 95% CI -7.27 to -2.83; Australia - Est. = -11.77, 95% CI -13.82 to -9.72) was also statistically significant.

Table 14

Mediating Effects of Resilience and Satisfaction with Academic Experience

	Point estimates B	SE	CI Lower	CI Upper
1. Direct effect of predictor (perceived stress) on mediator (resilience)	-1.30*	.20	-1.69	- .91
2. Direct effect of predictor (perceived stress) on mediator (SAE)	.03	.06	- .08	.15
3. Direct effect of covariate (Hong Kong) on mediator (resilience)	-8.93*	3.19	-15.18	-2.56
4. Direct effect of covariate (Australia) on mediator (resilience)	-3.71	3.09	-9.77	2.37
5. Direct effect of covariate (Hong Kong) on mediator (SAE)	-2.36*	.63	-3.60	-1.12
6. Direct effect of covariate (Australia) on mediator (SAE)	- .26	.63	-1.48	.94
7. Direct effect of mediator (resilience) on second mediator (SAE)	.05*	.01	.03	.08
8. Total effect of predictor (perceived stress) on depression	.55*	.08	.39	.72
9. Total effect of covariate (Hong Kong) on depression	-5.05*	1.12	- 7.27	-2.83
10. Total effect of covariate (Australia) on depression	-11.77*	1.03	-13.82	-9.72
11. Indirect effect of predictor (perceived stress) on depression via resilience	.11*	.04	.03	.19
12. Indirect effect of predictor (perceived stress) on depression via satisfaction	.00	.01	- .01	.01
13. Indirect effect of predictor (perceived stress) on depression via resilience and satisfaction	-.01	.01	- .02	.01

Note. N=221; * represent statistically significant effects; CI – bootstrapped confidence intervals; Effect of resilience on depression: Est. = -.08, 95% CI -0.13 to –0.02; Output variable: depression subscale

Discussion

The purpose of the current study was to investigate the role of resilience in the prevention of perceived stress and psychological distress, and SAE in EA university students studying in different developed regions. Examining these facets in EAs from these regions was chosen to better understand the similarities and differences between EA university students in terms of their levels of resilience, perceived stress, psychological distress and SAE and the contextual factors impacting on these. This study also investigated how differing levels of resilience (i.e., very low to very high) are associated with psychological distress, perceived stress, and SAE among EAs from these regions (i.e., Australia, USA and Hong Kong). The moderating and mediating roles of resilience and SAE in the relationships between perceived stress and psychological distress were also examined.

In this study several hypotheses were confirmed or partially confirmed. Hypothesis 1 which stated that EA students studying in Hong Kong would report significantly higher perceived stress and psychological distress, and significantly lower resilience and SAE compared to students studying in Australia and USA was partially supported. Whilst students studying in Hong Kong reported higher perceived stress and psychological distress and lower levels of resilience and SAE compared to those studying in Australia or USA, only resilience and SAE were significantly lower. Despite being partially supported, these results provide support for the struggle of young people studying in this region. As previously mentioned, the unique confounding variables such as political turmoil and social unrest have significantly impacted with mental health and well-being of young people attending university in that region (Ong & Chu, 2022).

These results also indicatedparticipants studying in Australia generally reported significantly lower psychological distress (particularly lower depression scores) as well as lower perceived stress compared to other locations.. Finally, participants studying in USA reported significantly less DASS-21 stress symptoms compared to those in other regions. Overall, whilst significant differences in mean scores were observed between regions across these variables, overall analysis showed region was not observed to make a significant contribution in subsequent moderation or mediation analyses

As discussed, Wong et al (2006) examined depression, anxiety, and stress in 7915 first-year university education students in Hong Kong, reporting findings of moderate severity or above across all aspects in 21%, 41% and 27% of the respondents, respectively. Sing and Wong (2010) found 68.6% out of 529 Chinese college students recruited from four

universities in Hong Kong. Lo et al., (2020) examined mental health in 135 Hong Kong university students and reported ten out of the 135 cases (1 in 14) showed active suicidal idea or recent suicidal attempt(s) that required urgent psychiatric intervention. In this study the top three recurrent themes of stress and maladjustment were academic work and stress (62%), family stress (33%), and peer/romantic related stress (18%). In the broader context, there are significant signs regarding poor adolescent mental health in Hong Kong. While the caseload of the child and adolescent psychiatric teams of the Hospital Authority rose from 18,900 in 2011–12 to 28,800 in 2015–16 (i.e., an increase of more than 50% in 5 years; Lam et al. 2015), with the complexity of the problems across multiple disciplines and sectors. These results highlight potential service gaps in the existing health and educational institutions in Hong Kong.

Whilst mental health concerns are prevalent internationally, in comparison to Australia these results suggest greater need for understanding on social/political context on mental health and resilience as well as cultural expectations of academic performance both at an individual and systemic level (Lo et al., 2020; Ong & Chu, 2022). Furthermore, when considering systemic aspects, Lo et al., (2018) contend that culturally students from regions such as Hong Kong do not wish to upset their parents, and often follow their instructions and wishes regarding study and career pathways even when they have no interest in the area. As a result, both family stress and academic stress can impact significantly. Finally, Lo et al., (2018) suggest that systemically, moving towards self-differentiation can be challenging at times for students within such cultural contexts, as there are sometimes strong expectations and dynamics regarding the young person's role in caring for parents and ensuring their happiness. This can impact on the young person's normal developmental processes associated with EA, such as identity development.

Limited research has examined these similarities and differences with regards to mental health, stress, resilience, and SAE between EA university students from different developing regions. Exploring these aspects allows for more individualised and appropriate targeted programs and interventions specific to region of origin and institution. It also provides insight into the unique challenges currently faced by EAs from different localities and provides guidance on the generalisability of the results. Again, this is essential for better understanding how to support and promote resilience in EAs.

Hypothesis 2 stated that significant differences would be observed based on resilience levels across all indicators of psychological distress measured with the DASS 21, as well as

measures of perceived stress and satisfaction with academic experience. Results showed participants with high resilience reported lower levels of psychological distress, lower levels of perceived stress and higher satisfaction with academic experience. Notably, participants with lower levels of resilience reported higher levels of psychological distress, perceived stress and SAE.

These results are consistent with previous research (Hjemdal et al., 2006; Pidgeon et al., 2014; Steinhardt & Dolbier, 2008; Storrie et al., 2010), which reported a significant relationship between resilience, psychological distress, and perceived stress among university student populations. However, to the author's knowledge, these results are the first examined specifically within EA university students across these regions. Additionally, resilience showed a significant positive association with SAE, with higher levels of resilience associated with higher levels of satisfaction. As SAE has been negatively associated with attrition rates this result provides additional support for the role of resilience in successful university transition and completion. These results also highlight the essential role of high resilience within this developmental stage.

Hypothesis 3 which stated perceived stress would positively predict psychological distress in EA university students was supported. Results showed perceived stress positively predicted psychological distress (DASS-21 Total) as well as anxiety, stress, and depression subscales separately, showing that participants with higher perceived stress also reported higher psychological distress scores. However, Hypothesis 4 was not confirmed with results showing that SAE did not significantly predict measures of psychological distress. Hypothesis 5 which proposed that resilience would negatively predict measures of psychological distress in EA university students was supported, with results showing that lower resilience scores predicted higher psychological distress scores in this population was supported.

The results of moderation analyses showed resilience scores moderated only the relationship between perceived stress and the DASS-21 stress subscale, where moderate to higher values of resilience resulted in a decrease in DASS-21 stress subscale scores when perceived stress was a predictor. These results provide partial confirmation for Hypothesis 6. Importantly however, these results suggest that EA university students with moderate and high resilience levels showed a reduction in reported DASS-21 stress symptoms even when their perceived stress was reported to be high. These findings suggest that resilience acts as a buffer in reducing the impact of a high stress perception on the actual experience of self-reported stress symptoms. That is, even though an event or experience may be perceived as stressful (e.g.,

transitioning to and undertaking unique developmental tasks associated with university), the capacity for resilience reduces the self-reported psychological and physiological symptoms of stress and therefore the impact of that stress.

With ever increasing rates of stress and psychological distress in this population globally, these results further highlight the important role of resilience in facilitating a successful transition to university. These results also highlight the importance of understanding of what comprises resilience within this population, and how these elements can be fostered and enhanced to buffer the effects of stress thus reducing psychological distress. Results showed that Hypothesis 7 was not confirmed, as satisfaction with academic experience was not a significant predictor of measures of psychological distress, and thus was not included in the analyses.

Finally, Hypothesis 8 which predicted that resilience would mediate the relationship between perceived stress and psychological distress was partially supported. Significant relationships between perceived stress and psychological distress (i.e., DASS-21 Total, Stress, Anxiety and Depression subscales) were partially mediated by resilience level. These findings confirm previously discussed findings that participants with lower resilience levels showed higher levels of psychological distress.

Despite numerous reports and studies highlighting the vulnerability of EAs to the development of stress, psychological distress and psychopathology limited research has focused on increasing understanding of resilience within EA university students and the role of this in buffering the effects of perceived stress during time of developmental change and transition. Given this stage is the very path and "rite of passage" to adulthood, neglecting to investigate and therefore understand the importance of resilience for this population means that a very real deficit in the development of appropriate support programs and interventions currently exist. It is arguably an opportune time to capitalise on this developmental stage and assist in both understanding and fostering adults with higher resilience throughout their lives.

Limitations and Future Research

Whilst this study makes several important contributions, several limitations are noted. Firstly, self-report methods and social desirability biases present as limitations. The main disadvantage of self-report questionnaires is the possibility of providing invalid answers (Demetriou et al., 2015). While responding to the items, respondents may not answer truthfully, especially on sensitive questions. This phenomenon is known as social desirability bias, in that they may respond in a socially acceptable way. There are also some issues that affect the validity

and reliability of the questionnaires. One of the issues is a response bias, which is an individual's tendency to respond in a certain way regardless of the question. For example, individuals may be more likely to respond "yes" regardless of the content of the question—known as an acquiescent response bias—or more likely to respond "no"—a non-acquiescence bias. Another problem in using self-report questionnaires might be the clarity of the items, which brings the risk of obtaining different interpretations of questions. Moreover, in the case of the highly structured questionnaires, the structure may force participants to answer in a way that does not match their views. Future research may consider the incorporation of the collection of collateral data and consider using a social desirability scale to avoid potential confounding of results.

Secondly, as the current study employed a correlational design, caution must be taken in the interpretation of the results as the findings do not necessarily demonstrate casual order of the interrelationships between variables. In addition to the abovementioned limitations, the current study should be replicated using a larger sample of university students to increase the generalisability of the results. Furthermore, future research could investigate the moderating effects of additional variables such as hope, optimism or self-compassion to determine whether they can be fostered as protective factors in the university context.

This research provides clear support for the essential role of promoting moderate to high level of resilience in this population, to increase capacity for buffering the effects of high perceived stress on EA university students experience of physical and psychological stress as they transition through this developmental life phase. It also highlights the importance of cultivating higher resilience levels to protect students' psychological well-being and promote their overall satisfaction with their unique experience of university.

Whilst this research significantly contributes to the literature pertaining to EA and resilience, fundamental research gaps and questions remain. Specifically, can a more comprehensive understanding of resilience be provided relevant to this population? One that considers the unique and complex tasks associated with this developmental stage. These results of this study suggest that the social and political context also plays an important role in these questions and outcomes as must be considered in the development of frameworks and interventions targeting resilience and psychological well-being in EAs.

Whilst rates of stress and psychological distress are rising globally in this population, it also appears evident that further research is needed to understand resilience specific to the relevant ethnicity and social/political environment of the region where young people are

studying. There is currently limited consensus regarding evidence-based resiliency models pertaining to an EA university population. Specifically, models which examine and provide evidence for the factors underpinning resilience, growth and adaptive meaning making through times and challenge and transition within this developmental phase. Subsequent studies will address these gaps.

Conclusion

To enhance understanding of psychological distress and resilience among EA university students from different regions worldwide, chapters 1 and 2 reviewed mental health concerns, social context and definitions of resilience with application to young students studying in these locations. Study 1 aimed to investigate the similarities and differences between EA university students studying in three different regions (i.e., Australia, Hong Kong, and USA), investigating their self-reported levels of resilience, perceived stress, psychological distress and SAE. This study also investigated the role of resilience in the prevention of perceived stress, psychological distress (i.e., anxiety, depression, and stress) and perceptions of satisfaction with the university experience among EA university students in these regions. These three regions were chosen because whilst EA can be identified within these places as a developmental stage, the social and societal context is varied and therefore worthy of exploration.

The results of this study highlight the impacts of social and societal context on young people's mental health and resilience and the need for targeted support interventions which consider these unique aspects. Importantly, the results highlighted that even though an event or experience may be *perceived* as stressful higher resilience reduced the self-reported psychological and physiological symptoms of the stress response.. This suggests that for those EAs with higher resilience, even when an event is perceived as stressful, they experience less stress symptoms both mentally and physically.

Considering the outcomes and reflections form this study, subsequent studies within this body of research aimed to address these gaps by developing and evaluating a model of resilience specific to EA university students studying in Australia. This included the development of a targeted framework and MBI designed to enhance resilience and psychological well-being in EA's studying in this region. A focus on EAs from Australia has been chosen for subsequent studies, with the prospect of application and adaptation of both model and intervention specific EA university students from other regions and context. The hope of this research is that the results provide understanding and guidance for the cultivation

of EA resilience, assisting to equip each young person with skills and knowledge which lay a foundation for resilience across the lifespan.

CHAPTER THREE
LITERATURE REVIEW: RESILIENCE AND THE EMERGING ADULT UNIVERSITY STUDENT

Chapter Overview

This chapter aims to expand on the understanding of resilience in the prevention of psychological distress and stress among EA outlined in Chapter 2, Study 1. Given the clear and vital role of resilience in EA well-being, this Chapter reviews contemporary theories and factors associated with psychological and physiological well-being, providing a novel perspective on resilience. Specifically, this chapter is centred on conceptualising the role of mindfulness meditation as a generative mechanism for personal transformation and integration of mind and body. Specifically, Eudaimonic Resilience will be defined and the Window and of Tolerance and the Eight Domains of Integration (Seigel, 2010) explored. The new concept of EI will also be proposed relevant to an EA population.

This Chapter also defines mindfulness and reviews the positive impacts of mindfulness meditation. The role of mindfulness meditation as a mechanism for psychological and physiological well-being and resilience will be summarised. More specifically, the concept of Mindsight and integration (Seigel, 2010) and the Mindfulness to Meaning Theory as a mechanism for positive re-appraisal (Garland et al., 2015) will be explored. Finally, the role of mindfulness meditation as a mechanism for fostering specific inner resources, including psychological and response flexibility, self-compassion, positive emotions will be discussed and conclusions regarding the development of a new mindfulness-based resiliency model with EA university students made.

Resilience: A Multifaceted Perspective

The Neuroscience of Resilience

The neurobiology of resilience is becoming increasingly well understood. Research into the areas of neuroscience have determined the specific brain regions associated with the modulation of stress, suggesting that resilience is associated with the ability to attenuate the response of the amygdala to stress and fear (Davidson, 2012). The left PFC, and the pathway between the PFC and the amygdala, play a critical role in inhibiting the duration of the amygdala's response to stress and shortening the time taken to recover from an event perceived as stressful (Davidson). From this perspective, enhancing resilience must involve understanding and engagement in strategies for increasing activation of the left PFC, facilitating new neural pathways for adaptation in the face of adversity. Overall, this research

suggests that an essential characteristic of resilience is centred on an individual's capacity to actively engage the PFC, allowing for enhanced executive functioning skills, adaptive self-regulation capacity and neuroplasticity - and in turn wiring the brain for enhanced future adaptive stress-response (Williams et al., 2006).

Understanding the role of the PFC in resilience is particularly salient when considering how to cultivate resilience in EA. During this developmental phase, the PFC develops fully, with successful maturation remaining sensitive to the environmental conditions and experiences during these years (Siegel, 2010; Tanner, 2006;). As previously mentioned, increased sensitivity to stressful stimuli during EA must consider the context of brain maturation; with age comes the potential for greater PFC development, less reactivity, increased emotion regulation skills and greater opportunity to reframe emotional reactions with cognitive interpretations that are more positive (Williams et al., 2006). This research suggests that as the EA's brain matures, the potential to maximise resilience rests on an individual's capacity to use their "resiliency muscle" – via a process of skill development and specific practices designed to activate the PFC and wire the brain for adaptation over time.

It is important to note that successfully activating the PFC (and re-wiring the brain for resilience) is only a potential independent of developmental age (Albert et al., 2015; Der-Avakian & Markou, 2011; Herman et al., 2016). Without appropriate knowledge and skills, stronger neural connections often remain between the amygdala and the PFC resulting in heighted emotional responses during times of stress. Understanding and changing the neurological pathways associated with this response is an essential component of resilience across the lifespan (McEwen & Tucker, 2011; McEwen et al., 2015). The brain's capacity for self-regulation is wired from an early developmental age through several important relational elements – including attachment with early caregivers, family modelling and potential trauma (Seigel, 2010). Therefore, an individual's "resiliency centre" largely comprising the PFC, is shaped by experiences from infancy (Brown, 2012; Siegel).

Specifically, adaptive self-regulation begins with healthy parent-child interactions, enabling the child to achieve balance and integration within the mind, as well as neural structures necessary for more autonomous forms of self-regulation (Buckley et al, 2018; Seigel, 2010). Self-regulatory structures of the brain include the integrative regions of the PFC, including the ventrolateral and medial prefrontal regions and the orbitofrontal and anterior cingulate cortices (Doidge, 2007; Shin et al., 2006). These regions appraise information from the social world, shaping regulation and resilience (Davidson & McEwen,

2012; Seigel, 2010). Targeted strategies designed to promote adaptive changes to established neurological pathways within the brain are possible despite early experience and habitual conditioning (Davidson & McEwen; Seigel).

The connections between the body, emotional, cognitive and social elements suggest the integrative and complex nature of our minds and capacity for adaption. Contemporary theories such as the Window of Tolerance and the Eight Domains of Integration suggest the need for flexible balance within the mind and body, where adaptive self-regulation is marked by the two branches of the ANS being flexibly in balance (Seigel, 2010). Specifically, an imbalance moving towards excessive sympathetic activation may result in a chaotic emotional state in the face of stress (e.g., inability to regulate emotions – out of control anger or anxiety), whereas excessive parasympathetic activation may result in rigidity and emotional shut down or paralysis in the face of stress (Dana, 2018; Davidson & McEwen, 2012; Seigel, 2010). The PFC plays a critical role in achieving balance and adaptive self-regulation skills, of enabling the individual to successfully cycle between connection and autonomy to achieve well-being (McEwen & Tucker, 2011; McEwen et al., 2015). Through acquisition of appropriate resiliency knowledge and skills, it is possible to capitalise the brains neuroplasticity and establish stronger neural pathways to engage the PFC during times of stress (Seigel).

Resilience and Self-differentiation

These concepts integrate with Bowen's Family Systems Theory (Bowen, 1978), which suggests our PFC and relationship with stressors is shaped systemically during childhood. From this perspective, understanding successful adaption across the lifespan must include examining reactions to life's challenges as part of relational systems by broadening perspective taking and providing a unique path to maturing. Specifically, this theory contributes greatly to the resiliency field, by suggesting that social relationships and family life cycle transitions often provide challenging events and changes, and therefore opportunity for the development of "maturity" or self-differentiation and balance throughout life (Brown, 2012).

This theory suggests that the development of self-differentiation involves attributes such as emotional awareness and regulation skills, interpersonal awareness and resources, acceptance of self and others whilst staying healthily connected and being responsible for mature problem solving (Bowen, 1978; Brown, 2012). Essentially, self-differentiation is an evolving process of obtaining internal and external "balance" within social systems, of staying

appropriately connected to others and responding with resilience to life's stressors as an individual (Brown, 2012; Skowron et al., 2009). This theory also aligns with theories of neuroscience regarding resilience, as the skills required to facilitate self-differentiation require engagement of the PFC, enabling more constructive complex decision and meaning making throughout life (Brown, 2012; Davidson, 2012).

When considering the concept of resilience as achieving "balance" within our minds, bodies and relationships (i.e., the process of achieving balance as a process of moving between healthy connection and individuation from infancy), this appears particularly relevant to the EA. During this life phase, the individual has the tasks of developing a distinguished identity separate from parents/guardians and seeking novel ways of being in the world as they transition from home; whilst continuing to focus on peer connections and redefining pre-existing relationships (e.g., with parents/caregivers; Arnett, 2005). This process requires specific skills to be successful.

Window of Tolerance and Eight Domains of Integration

Siegel (2012) proposes the term of integration of mind, suggesting that resilience and well-being rest on the successful integration (i.e., balance) of these differentiated components of mind and body, enabling the system (both within the individual, as well as within the context of their social relationships) to move towards harmony and well-being. Seigel suggests that integration involves a system which is flexible, adaptive, coherent, energised and stable (FACES) internally in response to external events. This theory also introduces the concept of the Window of Tolerance (Seigel, 2010). Resilience during personal change throughout life is often dependent on the width of an individual's Window of Tolerance. This window can be described as a band of arousal representing healthy functioning. When this width is larger, homeostasis is maintained in the face of stressors. When experiences push individuals outside this window, they fall into patterns of emotional coping and responses that are described as either ridged (e.g., depression, cut-offs, avoidance) or chaotic (e.g., agitation, anxiety, rage; Seigel).

The Window of Tolerance (Seigel, 2012) aligns with the concept of integration*;* a process of separate components linked together as a whole. This concept describes the capacity to stay within the Window of Tolerance (i.e., neither ridged or chaotic), and emerges when the left and right sides of the brain are functioning together (Seigel). Promoting integration within components of the mind and body enable the Window of Tolerance to widen promoting well-being and resilience. Through targeted skills, individuals can alter the

way the mind functions, moving their internal and external lives toward integration, resilience and health.

Seigel (2012) proposed eight domains comprising integration as being key to personal transformation, resilience and well-being. Seigel suggests integration within these domains are associated with an internal and external system that is flexible, adaptive, coherent, energised and stable. These domains are associated with a widening of the personal Window of Tolerance and capacity for homeostasis during challenging times, that is not falling into patterns of either rigidity or chaos in terms of coping and response. The eight domains are summarised in Table 15 below.

Table 15

Summary of the Eight Domains of Integration (Seigel, 2012)

Integration Domain	Summary
Integration of Consciousness	• Skills to direct and stabilize attention to harness power of awareness to create choice and change • Capacity to be aware of experiences without being overcome by them • Helps regulate mood, emotions, calm the ANS, cultivate flexible and stable mind and forms foundation for subsequent domain integration
Horizontal Integration	• Harnessing the power of neuroplasticity to integrate the right and left hemispheres of the brain • Enhances coherent meaning making, insights into self and others, creativity and richness of life
Vertical Integration	• Focuses on linking differentiated aspects of the nervous system via bottom-up and top-down processes • Attunement and awareness of bodily sensations, feelings and perceptions • Understanding the intuitive wisdom of the mind and body
Memory Integration	• Awareness of insight of implicit memories, and actively moving these to explicit memories • Process promotes living in the present moment, opening choices and paths in life
Narrative Integration	• Making sense of life by creating stories that incorporate the left hemisphere "narrator function" with the autobiographical memory storage of right hemisphere • The ability to make meaning and narrate life and experiences in a coherent manner
State Integration	• Moving beyond past patterns of adaptation and denial to become open to current needs and being able to meet those in various ways at different times • Embracing all aspects of self and needs
Interpersonal Integration	• Seeing how past ways of adapting are restricting current relationships, allowing the self to open safely to others • Connecting intimately with others whilst retaining own sense of identity and freedom (i.e., self-differentiation)
Temporal Integration	• Enables living with more ease and finding comforting connections in the face of uncertainty • Integrating challenges presented by the PFC regarding; uncertainty, impermanence and mortality

These aspects are not considered to evolve linearly, tending to emerge in various combinations over time. Sense of self is proposed to be directly shaped by the degree of integration in these eight domains. Siegel suggests that within each person there is a drive towards integration. This can, however, be impaired by aspects such as unresolved trauma as well as impairments to the process of self-differentiation caused by aspects such as developmental difficulties. These domains of integration are relevant to the EA as they move into the first life cycle transition of launching from the family home, undertaking developmental tasks associated with change, identity formation and the process of self-differentiation as they move towards adulthood.

Eudaimonic Resilience

Researchers have begun exploring the differences between hedonic and eudaimonic resilience to better understand how to foster growth and adaptation. Hedonic resilience is a process that, following a potential trauma or loss, involves affect regulation alone, allowing for reduced recovery time (Bonanno, 2004). A focus on assessing hedonic resilience following loss or trauma focuses on recovery to baseline (return to homeostasis) for affect and meaning. Eudaimonic resilience is a process that involves the qualities of hedonic resilience and includes growth of personal meaning in one's self-identity where growth-oriented self-identity is a likely candidate of individual differences to predict eudaimonic resilience (Bauer & Park, 2010). For example, this perspective may consider aspects such as a widening in the Window of Tolerance for affect regulation, and expansion in growth narratives around life events (Bauer & Park).

Considering resilience from this perspective integrates with ideas within the positive psychology movement regarding the study of well-being and mental health (Di Fabio & Palazzeschi, 2015; Seligman & Csikszentmihalyi, 2000; Vázquez et al., 2006). Specifically, in examining well-being, two branches have emerged; hedonic well-being (Kahneman et al., 2004) and eudaimonic well-being (EWB; Ryan & Deci, 2001; Ryff & Singer, 2008; Waterman et al., 2010). The hedonic approach focuses on happiness, defining well-being in terms of pleasure attainment and pain avoidance (Kahneman et al., 2004). It can be considered as subjective well-being (SWB: Kahneman et al., 2004) consisting of a cognitive component of evaluation in terms of life satisfaction and an affective component characterized by the prevalence of positive emotions rather than negative emotions.

In contrast, the eudaimonic approach, relates to meaning and self-realization, where well-being is seen as the full functioning of the person (Ryan & Deci, 2001). More

specifically, it focuses on resources and strengths and on life meaning, authenticity, and purposefulness (Waterman et al., 2010). Eudaimonic well-being is characterised by a sense of purpose and meaningful, positive engagement with life that arises when one's life activities are congruent with deeply held values even under conditions of adversity (Rhyff, 2018; Garland et al, 2015). These concepts were originally proposed by Carol Ryff's (1989, 1995) model of eudaimonic well-being. More specifically, Ryff identified six dimensions that represent components of psychological flourishing and living at one's potential: (1) being autonomous and independent, (2) having mastery and control over one's environment and activities, (3) having continued feelings of personal growth and development, (4) having positive and quality relationships with others, (5) having purpose and meaning in life, and (6) acceptance of oneself.

The concept of Eudaimonic resilience compliments neurobiological and systemic theories regarding adaptation and can be framed as a dual-process model of adaptation including 1) affect regulation, and 2) meaning regulation. Affect regulation involves the capacity to regulate positive and negative emotionality, notably the hedonic concerns of approaching pleasure and avoiding or escaping pain (Ryan & Deci, 2001). Meaning regulation involves the capacity to focus on, construct, and reconstruct meaning in one's life – that is, one's self-identity (Bauer & Park). This dual-process model of resilience is related to other dual-process models that focus on affect and meaning-making in self-identity development (Bauer et al., 2010; Labouvie-Vief, 2003; Staudinger & Kunzman, 2005). Each model approaches health from a more eudaimonic than merely hedonic perspective, so the two processes of affect and meaning making are both essential to healthy adaptation

This definition of resilience differs from traditional theories, where return to baseline affect levels is often considered indicative of well-being. In contrast, this adaptive meaning making process involves evaluation throughout the lifespan; where successfully navigating the challenges and stressors associated with previous life stages equips the individual to make purposeful meaning of such events and experiences in a way which fosters mental health and growth (Bauer & Park, 2010). Considering resilience in this way further highlights the importance of understanding the EA in the context of relevant life cycle stages and systemic theories (Carter & McGoldrick, 1989).

The present study adopts the definition of eudaimonic resilience when describing the process of maturation within the EA, by considering adaptation as a dual process of adaptive self-regulation and meaning making following stressors. However, the current research also

extends this theory by proposing the process of resilience must consider the neurobiology and integration, and life cycle stage of EAs when considering how to best understand and foster well-being during and after adversity.

This dual process of regulation and meaning making can be considered in the context of the domains of integration outlined above (Siegel, 2012), which emphasises moving towards adaptive, flexible, and stable states of psychological and physiological well-being throughout life as being synonymous with resilience. Sigel (2012) contends that integration describes the development of distinct brain processes being bought into a functioning whole. Specifically, when the more complex reflective and conceptual processing of the PFC is combined with the more basic emotional and motivation brain elements such as the amygdala, integration and psychological flexibility is possible. However, when the reflective and executive functions of the PFC are "cut off," psychological inflexibility, non-integrated and reactive response to events is more likely (Siegel, 2012). By fostering a more balanced and integrated mind, interpretation of adverse experiences and the capacity for beneficial meaning making is possible, and in turn may create more harmonious systemic relationships (Brown, 2012; Seigel, 2012; 2013).

In addition to self-regulation skills as a component of this process, the current research extends this by directly examining how flexible perspective taking and a compassionate self-relationship assist in the process of adaptive appraisal and beneficial meaning making within EA university students. The current research also suggests that theories of resilience must specifically consider the context of family life cycle transitions to best understand the development of self-differentiation when fostering eudaimonic resilience in EAs. As previously mentioned, self-differentiation is a continuum and involves attributes such as emotional awareness and regulation skills, interpersonal awareness and resources, acceptance of self and others whilst staying healthily connected in relationships (Brown, 2012; Skowron et al., 2009). The concept of self-differentiation highlights many overlapping elements with eudaimonic well-being and resilience. An evolving process of obtaining internal/external "balance" within social systems, of staying healthily connected to others and being able to autonomously *respond* rather than react to life's stressors (Brown, 2012). These theories and perspectives provide important elements for consolidation and direction regarding understanding the resilience and well-being for the EA.

A New Concept: Eudaimonic Integration

To the author's knowledge, resiliency definitions and theories to date have not consolidated these elements with application to an EA population. Therefore, the current research proposes a new concept and term, *EI,* as a more comprehensive definition of resilience, with potential application across the lifespan. EI proposes that the process of fostering adaptive self-regulation, meaning making and wisdom during and following adversity involves integrated neurobiology and balanced, adaptive components of mind and body considered within the context of relational systems (Brown, 2012; Seigel, 2012). This is where the individual is moving towards a differentiated sense of self within social spheres (Bowen, 1978; Skowron et al., 2009). Many people report experiencing stress or adversity that is associated with significant relationships in their lives. This may be events or changes that occur in relationships with partners, family members, friends, colleagues, acquaintances and within community and society at large (Brown, 2012).

The current research proposes through the development of EI an individual moves towards greater integrated neurobiology, enhancing their capacity to navigate stressors and relationships with increasing self-awareness and regulation, psychological flexibility, adaptive meaning making and self-differentiation, remaining healthily connected and confidently autonomous during times of adversity.

This new concept further extends systemic theories by proposing that the quality and balance within relationships with others is not the only relationship salient to a resilient stress response. Moving towards an accepting and compassionate self-relationship, is proposed as a critical foundation during EA in moving towards integration of mind and body and self-differentiation. This research contends that self-compassion is an essential component of maintaining self- regulation, psychological flexibility and beneficial meaning making throughout life to flourish and reach individual potential.

This research proposes that EI fluctuates across time and is an ongoing process of cultivation requiring effort and commitment to create and sustain, much like a muscle within the body. However, it is also proposed that over time, despite these fluctuations, with committed action, EI within the individual increases in ever expanding ways. Specifically, this suggests EI is a transitory state which, when engaged in repeatedly over time, may accrue into trait or dispositional EI.

Overall, this new concept proposes that through an evolving process of active integration and self-differentiation, the capacity for adaptive self-awareness and regulation, self-compassion, flexible perspective taking and therefore beneficial meaning making are

possible across the lifespan. It is proposed that these elements naturally lead to greater experience of positive emotions, psychological well-being and adaptive stress response. For the EA, fostering integration and balance within the mind-body and relationships (both self and others), is particularly salient as they move towards self- differentiation and the establishment of adult identities.

The opportunity for continued growth and maturity in life and relationships is inevitably linked to exposure to stressors and adversity (Brown, 2012; Seigel, 2012), particularly with others. These interactions and events provide the opportunity to learn to respond with intentionality and flexibility, gain insight and understanding, and cultivate compassion to move forward with increased resources. The new theory of EI contends that resilience and well-being is founded on the *quality, flexibility and health* of relationship with self, others and the world across the lifespan; and our capacity to bring awareness to and make beneficial meaning of events within these relationships. This, in turn, facilitates growth and integration in the face of commonly shared challenges associated with being human. This concept embodies the notion that it is not just how we can assist individuals to handle stress better, but rather how can we assist them to flourish and reach their potential in ever increasing ways as they face inevitable challenges.

Mindfulness Meditation and Eudaimonic Integration

The current research has proposed EI as a more comprehensive and consolidated concept and understanding of resilience for EAs. As previously mentioned, EI considers the neurobiology and unique systemic tasks and potential stressors associated with this developmental stage and focuses on understanding the role of self-regulation and awareness, self-compassion, positive emotions, and psychological flexibility in promoting beneficial meaning making. This complex interplay brings the question of *how* to foster such integration within the EA.

Learning skills to focus attention and live with intentionality and awareness is suggested as an important starting point, which can in turn foster compassion and understanding for self, others and the world (Seigel, 2012; 2013). When individuals begin to cultivate self-awareness, in a compassionate and self-supportive manner, this intentional stance and commitment to self-understanding and acceptance becomes an open and purposeful approach to a life focused on growth (Seigel, 2012). Research in the field of neurobiology suggests that three aspects of the brain function coexist and determine growth: self-reflective function, self-knowledge, and response flexibility (i.e., executive function;

Davidson, 2012; Siegel, 2012). These higher order mental processes enable intentional response in a variety of settings, including during situations perceived as stressful. Having well-developed executive functions and intentionality, enables response flexibility and empathy, enhancing compassion towards self and others (Seigel, 2010). This research proposes that through increased self-awareness, psychological flexibility and self-compassion, beneficial reappraisal of events may be possible, generating eudaimonic meaning and mind-body integration during EA and beyond.

One practice that has demonstrated a growing body of support over the past three decades within the psychology and medical fields for the positive impact on neurobiology is mindfulness meditation (Brown et al., 2013; Jermann et al., 2009). The benefits of mindfulness-based practice have been an established aspect of Buddhist philosophy for over 2,500 years (Armstrong, 2001; Baer, 2003). However, the practice of mindfulness meditation has only recently been integrated into western psychology and medicine, with scientific evidence demonstrating support for mindfulness in enhancing numerous aspects of mental and physical development and well-being. Most recently, researchers have begun exploring the role of mindfulness in cultivating adaptive stress response and even post-traumatic growth (Marchand, 2012; Tedeschi & Blevins, 2015). Mindfulness meditation has also been shown to enhance university students' mental and physical health, including improvements in distress, stress, anxiety, depression, well-being and rumination (Dawson et al., 2020).

Definitions of Mindfulness

The word mindfulness is a modern translation for the word sati in Pali – a language native to India and spoken during the time of the Buddha (Treleaven, 2018). The term has several meanings including *presence of mind, memory, and clear awareness* (Treleaven). Various definitions of mindfulness have been proposed. The theoretical definition of *mindfulness* is described as; (a) bringing one's full awareness to the present moment in a nonjudgmental/accepting manner, and (b) the ability to describe internal and external subjective experience and respond to it with intentionality (Marchand, 2012). This awareness and intentionality foster the ability to catch oneself on "automatic pilot" and notice, observe and accept thoughts, feelings, sensation and experience in any given moment (Baer, 2010). Mindfulness is described as awareness; one of the many forms of meditation, where meditation can be considered as any way in which we engage in; 1) systematically regulating our attentions and energy, 2) thereby influencing and possibly transforming the quality of our experience, 3) in the service of realising the full range of our humanity, and of 4) our

relationship to others and the world (Bishop et al., 2004; Kabat-Zinn, 2011). Bishop and colleagues (2004) also propose a two-component model of mindfulness; 1) the first component involves the self-regulation of attention so that it is maintained on immediate experience, and 2) the second involves adopting a particular orientation towards one's experience in the present moment, an orientation that is characterised by curiosity, openness and acceptance.). Mindfulness can be described as a way of being in the world or a *state of consciousness* (Page, 2019). Tang et al., (2015) also describes mindfulness meditation as a conscious and complex cognitive process involving concentration and receptive attention. However, these are all merely working definitions as ultimately mindfulness is something that needs to be practiced and experienced in order to be understood (Wolf & Sepra, 2015). Mindfulness is considered a complex and "felt" and known experience that scholars and practitioners alike have found challenging to describe in its entirety for thousands of years. Overall, *mindfulness teaches us how to relate to our experiences differently – even our stress and pain.*

The definition adopted within this research is that proposed by Kabat-Zinn (1990). Kabat-Zinn defined mindfulness as "paying attention in a particular way; on purpose, in the present moment, and non-judgementally (1990, p. 4)." Table 16 below summarises these three components.

Table 16

Defining the Components of Mindfulness (Kabat-Zinn, 1994; Treleaven, 2018)

Component	Description
Purposeful Attention	• Learning to intentionally direct and sustain attention • Assist to steady the "wandering mind" • Capacity to attend to sensations connected to breath, body, thought or emotion
In the Present Moment	• Grounding attention in the "here and now" rather than becoming lost in thoughts of the past or future • Opening to and receiving what is, right now • The aware and balanced acceptance of the present experience
Non-judgmental Attention	• Bringing an attitude of curiosity, acceptance, and even self-compassion to the present moment experience • Remaining open and inquisitive to all sensations and experience • A mechanism for becoming less reactive and clearly observing what is unfolding in the present moment

This three-part definition is the most widely accepted in western international research and the benefits of mindfulness on mental and physical health are well documented (Garland, 2007; Kabat-Zinn, 2005; Lutz et al., 2008). However, the questions regarding what makes mindfulness so powerful remains unknown. Mindfulness is difficult to operationalise - that is, to distinguish its components in a way that effects can be measured (Treleaven, 2018). Corcoran et al., (2010) explained that although the benefits of mindfulness practice are generally accepted, the specific mechanisms and processes that operate in their attainment are largely unknown.

Despite this, researchers have attempted to isolate the individual components of mindfulness for study. For example, Bishop et al., (2004) describes mindfulness as a state of awareness, comprised of two components: self-regulation of attention to immediate experience; and maintenance of a specific orientation towards the immediate experience. Self-regulation of attention to an immediate experience involves sustained attention, attention switching, and the inhibition of elaborative processing. The maintenance of a specific

orientation incorporates curiosity, experiential openness, and acceptance regardless of the emotion, thought or sensation present (Bishop et al., 2004). This practice allows for an accepting and non-judgemental view of one's internal (e.g., thoughts, feelings and physiological symptoms) and external (e.g., sounds and sights) present moment experience (Baer et al., 2006).

Using factor analytic methods, Baer et al. (2006) argued that mindfulness comprises multiple facets including; (a) observing – attending to a variety of internal or external phenomena; (b) describing – applying labels to observed phenomena; (c) acting with awareness – engaging fully in one's present activity; (d) non-judging of inner experience – taking a non-evaluative stance towards thoughts and feelings; (e) and non-reactivity to inner experience - accepting thoughts and feelings and allowing them to come and go without getting carried away by them. Other mechanisms identified include attention regulation, body awareness and emotional regulation (Treleaven, 2018)

Researchers suggest there is both state and trait mindfulness. State mindfulness can be described as an attentive and nonjudgmental metacognitive monitoring of moment-by-moment cognition, emotion, perception, and sensation without fixation on thoughts of past and future. Mindfulness includes a range of formal meditation practices undertaken regularly and informal practices aimed at bringing attention and awareness to all aspects of life (McConville et al., 2017). The mindful states of consciousness occurring during mindfulness meditation can be described as state mindfulness. In contrast, dispositional or trait level mindfulness can be fostered over time with practice and reflects the tendency to embody nonjudgmental awareness in everyday life (Baer et al., 2006; Garland, 2007, 2011; Kabat-Zinn, 2005; Lutz et al., 2008).

When individuals and systems lack the capacity for non-judgemental, present moment awareness and the skills for fostering mindful states of consciousness during transition points, this can significantly impact well-being. These include but are not limited to 1) lacking awareness of emotions and mood states and how they impact our experience, 2) creating and holding tension and stress in the body without awareness, 3) missed opportunities for positive emotional experiences and moments, 4) missing critical information for important decision making, and 5) the tendency to "hold onto" unpleasant emotions, moments and experiences in our mind and body long after they are finished (Wolf & Sepra, 2015). Below is an expanded summary of the mindfulness evidence base and research findings in three general categories: 1) symptom reduction, 2) biological markers in the body, and 3) neuroplasticity.

Symptom Reduction

Significant research has established evidence for the effectiveness of MBIs and symptom improvement for a wide variety of psychological and physical conditions. Primarily measured via self-report methods, these include significant improvements in psychological functioning such as depression, anxiety, and stress (Jimenez et al., 2010; Masuda & Tully, 2012) and can facilitate a range of well-being outcomes including lower stress perception (Baer et al., 2006; Weinstein et al., 2009). Furthermore, research has demonstrated benefits including lower reported pain and illness distress, increases in quality-of-life, better quality sleep, functional status, more adaptive coping strategy use (Weinstein et al., 2009) and an ability to see situations more objectively with an increased capacity for responding rather than unconsciously reacting (Brown & Ryan, 2003).

Indeed, theoretical and empirical studies have supported the application of mindfulness-based treatments to problems and populations including, but not limited to, psychosis (Khoury et al., 2013), chronic pain (Veehof et al., 2011), other chronic medical conditions (Bohlmeijer et al., 2010), post-traumatic stress disorder (Dutton et al., 2013), bipolar symptoms (Weber et al., 2010), hypochondriasis (Lovas & Barsky, 2010), borderline personality disorder (Gratz & Tull, 2010), eating disorders (Cowdrey & Park, 2012), diabetes management (Noordali et al., 2017), epilepsy related seizures (Wood et al., 2017), couples issues (Quinn-Nilas, 2020), and childhood trauma and attachment issues (Costello & Short, 2021).

Whilst mindfulness has typically been recognised as an important strategy and practice to enhance psychological and physiological well-being of clients and patients (Kabat-Zinn, 2005), there is now increasing interest and research examining the impacts of MBIs to improve student well-being and enhance academic performance. A study by Canby et al., (2015) showed that engagement in Mindfulness-based Stress Reduction (MBSR) reduced university students' psychological distress and increased mindful awareness, self-control and subjective vitality. Within this EA population, mindfulness has also demonstrated efficacy for improving anxiety and stress (Zhou et al., 2020), and depression and suicidal ruination (Moeller et al., 2020).

Engagement in mindfulness has also demonstrated positive impacts for sub-groups of EA university students, such as young medical students, at increased risk for psychological distress, chronic stress and burnout. In addition to protecting from these aspects, mindfulness practice has demonstrated efficacy in assisting to prepare health practitioners to be reflective,

empathic, and patient centred in their clinical practice (McConville et al., 2017). A systemic review of randomised control trials by McConville et al on the efficacy of MBIs with health profession students reported positive outcomes of mindfulness training in relation to decreasing anxiety, stress and depression and increasing positive mood states, self-efficacy, mindfulness and empathy in health profession students. A total of seven out of the 19 trials data were collected in a high stress period for students (prior to exams). Statistically significant, positive results currently provide support for mindfulness meditation training as an effective tool for coping with potential stressors of university life (McConville et al., 2017).

Biological Markers in the Body

Research suggests that the low-risk behavioural intervention of simply teaching an individual to pay attention with kindness to the present moment can have profound impacts on how the body functions. Numerous researchers are exploring psychoneuroimmunology: the study of the complex relationships between behaviour and psychological, neurological, and immunological functioning (Wolf & Sepra, 2015). One example is the analysis of salivary cortisol, the primary stress hormone released from the adrenal glands associated with immunosuppression (Spiegel, 2014). The research into the area of using salivary cortisol as a reliable test of cortisol is somewhat conflicting. At present, several salivary biomarkers such as salivary cortisol are currently being used in stress research (Crnković et al., 2018). Salivary biomarkers are more popular in stress-related research because it is easy and non-invasive to obtain and has been proven to be better than testing biomarkers from the blood (Yia & Moochhalab, 2013). Some researchers suggest that changes in salivary and serum cortisol levels are an effective biomarker indicating a reduction in stress following treatment programs such as MBIs (Matousek et al., 2009).

However, a meta-analysis conducted by Sanada et al., (2016) showed a significant moderately low effect for improving the state of health, based on cortisol levels, resulting from MBIs in healthy populations, with moderate heterogeneity and a low risk of publication bias. On the other hand, these researchers reported the sub-group and meta-regression analysis suggested possible differences according to the type of measure used, and the age of participants, as well as a dose-response relationship between the hours and number of sessions of the programme, and the effect obtained. Taking the included studies independently, one trial (Jensen et al., 2012) showed obvious effects of MBIs on the levels of salivary cortisol, whilst another trial (Rosenkranz et al., 2013) showed marginal effects. These two trials used

standardised measures of cortisol. In contrast, the other trials included in the analysis, which used raw cortisol data (Klatt et al., 2009; Oken et al., 2010; Flook et al., 2013), showed no significant efficacy of the MBIs.

In the study of epigenetics, studies have demonstrated measurable epigenetic changes in the genome following eight weeks of meditation training, with the downregulation of pro-inflammatory genes (Creswell et al., 2012). Furthermore, Epel et al., (2009) found that mindfulness training can have a beneficial impact on telomere length (i.e., distinctive DNA structures found at the ends of chromosomes which act as a protective cap) . Cognitive stress and constant rumination on potential threats creates a stressful environment that in turn, shortens telomere length and the protective enzyme telomerase. Specifically, mindfulness training reduced the cognitive stress and physiological arousal that is associated with the shortening of telomere length, thus decreasing cellular ageing (Epel, 2009).

Furthermore, several studies have demonstrated the regulatory effects of mindfulness meditation on aspects of physical health, including improved immune function (Creswell et al., 2019), reduced blood pressure and cortisol levels (Lucas-Thompson et al., 2019), and increased telomerase activity (Reive, 2019). More specifically, research by Hodge et al., (2017) demonstrated larger reductions in stress markers for patients with Generalised Anxiety Disorder (GAD) following Mindfulness-Based Stress Reduction (MBSR) compared to controls; providing evidence for positive hormonal and immunological changes following mindfulness meditation in response to a stressful situation. Specifically, seventy adults with GAD were randomized to receive either MBSR or an attention control class; before and after, they underwent the Trier Social Stress Test (TSST). Area-Under-the-Curve (AUC) concentrations were calculated for adrenocorticotropic hormone (ACTH) and pro-inflammatory cytokines. MBSR participants had a significantly greater reduction in ACTH AUC compared to control participants. Similarly, the MBSR group had a greater reduction in inflammatory cytokines' AUC concentrations.

Mind-body strategies such as mindfulness meditation are proposed to benefit health and well-being and promote resilience through an integration of top-down and bottom-up processes which facilitate bidirectional communication between the brain and body (Muehsam et al., 2017). Top-down processes, such as regulation of attention and intention setting, have been shown to decrease psychological stress as well as hypothalamic-pituitary axis (HPA) and sympathetic nervous system (SNS) activity, promoting well-being and immunity (Sullivan et al., 2018; Taylor et al., 2010). Bottom-up processes such as breathing

techniques and mindful movement, have been shown to influence the musculoskeletal, cardiovascular and nervous system function with positive changes in immune function and emotional well-being (Muehsam et al., 2017; Sullivan et al., 2018). The top-down and bottom-up processes employed in mind-body strategies, such as various types of mindfulness meditation, regulate autonomic, neuroendocrine, emotional and behavioural activation and promote adaptation in response to challenge and adversity (Taylor et al., 2010).

Neuroplasticity and Neurobiological Changes

Mindfulness meditation techniques are increasingly showing evidence as effective treatments in various clinical conditions. Consequently, encouraging research has been focused on mechanisms and models to explain the underlying molecular principles and their neurobiological foundations. At the centre of this growing interest lies a possibility for physiological, psychological, and neurobiological potential and resilience in the face of stress (e.g., Costello & Walters, 2021; Malhi et al., 2019).

Studies have demonstrated a regional increase in the activity of numerous specific areas of the brain in participants during and after meditation. These include areas such as the orbitofrontal cortex – responsible for attention control and "emotionality" of physiological responses, insular cortex and (central) autonomic functions– responsible for interoception; and hippocampus – responsible for regulating and evaluating emotions and linking them to memory formation (e.g., Baltruschat et al., 2021; Miyashiro et al., 2021; Young et al., 2018).

According to the model of frontal alpha-symmetry of cortical activation, a relative increase in left-anterior brain activity is associated with positive feelings and improved immune function (Davidson, 2004). Compared to controls, participants who took part in a brief mindfulness course showed significantly stronger activation of left frontal areas of the brain, associated with a greater increase in antibody titer following an influenza shot (Davidson & McEwen, 2012). An antibody titer is a type of blood test that determines the presence and level (titer) of antibodies in the blood. This test is carried out to investigate if there is an immune reaction triggered by foreign invaders (antigens) in the body (Davidson & McEwen). The extent of the increase in cortical activity correlated with the increase in the antibody titer. This finding provides support for the continuity between central and peripheral processes and are important as they suggest the potential of mindfulness for strengthening integration of the mind and body in the process of enhancing human potential (Santaella, 2021).

Newberg and Yaden (2018) identified a neurophysiological pattern of changes that occurred during meditative states that included certain key cerebral structures and hormonal and autonomic reactions, indicating changes in cognition, sensory perception, as well as affect (affective state), and an overall brain-based impact on endocrine-hormonal and autonomic activity. Moreover, researchers have also established increased functional – and structural – asymmetries, in particular lateralization and a tendency to shift activity 'forward', a so called 'anteriorization' seem to be relevant. Overall, this research demonstrates that meditation may cause structural changes to the brain. Compared to individuals who do not meditate, those who meditate regularly showed increased thickness of various areas of the PFC. This can be specifically observed in those areas associated with attention and memory, interoception, and sensory processing as well as with self-regulation and autoregulation (Hölzel et al., 2010; Kang et al., 2013; Pernenkil, 2018). When considering the three key identified areas relating to growth and integration (self-reflective function, self-knowledge, and executive function), mindfulness clearly facilitates the required PFC "growth" and re-wiring needed to enhance this capacity.

Moreover, Creswell et al. (2019) found that subjects with a higher level of self-attributed mindfulness displayed greater prefrontal cortical activation and deactivation of the amygdala when naming emotions. Furthermore, significant positive correlations have also been demonstrated between structural and objective brain changes and subjective perception of stress; with lower self-reported perceived stress and enhanced coping capacity (Hölzel et al., 2010). These findings confirm the assumption that mindfulness has a positive effect on neuronal pathways that regulate affect and emotions, providing support for mindfulness as a direct skill for changing the brain (Esch et al., 2018). These findings also highlight the role of mindfulness in neural growth within the PFC, and the potentially essential role mindfulness meditation therefore plays in enhancing integration of the mind and the newly proposed concept of EI.

In addition, mindfulness meditation has also been associated with functional changes in brain activity associated with empathy and compassion. Specifically using an EEG, Lutz et al. (2004) demonstrated that engagement in a specific type of compassion meditation (i.e., loving kindness meditation; LKM) over several years was associated an increase in high frequency, synchronized gamma waves. The gamma band in the parietal or parieto-occipital and temporal region, appears to refer to the experience of 'dissolution of boundaries or transcendence, and the 'quality of compassion', including the perception of unity and

coherence (Lutz et al., 2004). Similar patterns have been observed during increased attention and functional learning processes and is associated with higher order conscious and cognitive processes, among other things. However, Lutz et al. study demonstrated that engagement in this type of meditation showed the coherence and synchronization of the high-frequency 40 Hz oscillation covered an extraordinarily large part of the brain. These findings are important and suggest that the type of meditation must be considered when aiming to promote neurological changes required for cultivating compassion (Raffone et al., 2019).

Research has demonstrated that relevant changes in brain waves within important brain regions can occur even after short periods (i.e., interventions less than the typical 8-week period) of meditation practice **(**Chan & Woollacott, 2007; Fennell et al., 2016). Furthermore, exciting research such as Stapleton et al., (2020) examined the effect of a brief guided meditation (i.e., three-day workshop comprising daily guided seated meditation sessions using music without vocals that focused on various intentions and emotions states) on stress training workshop for novice meditators aged 19 to 83 years (n = 468). Participants' pattern of brainwave power bands at each meditation endpoint were compared with baseline measures (i.e., alpha, delta, and theta oscillations). Meditation competence via functional brain integration was evaluated using measures of high-frequency gamma synchronization. Overall results suggested the brief meditation intervention had large varying effects on EEG spectra, and the speed of change from pre-meditation to post-meditation states of the EEG co-spectra was significant (Stapleton et al., 2020). This study provides support for brief meditation as an effective intervention for altering consciousness state in novice meditators (Stapleton et al., 2020).

These studies provide scientific and tangible evidence of the neurological and physiological benefits of long and brief mindfulness meditation. As a practice, mindfulness meditation promotes moving towards a more integrated and adaptive internal mechanisms (Seigel, 2012). The following section summaries the relationship between mindfulness meditation and inner adaptive resources such as psychological flexibility, self-compassion, positive emotions and the capacity for positive reappraisal.

Mindfulness Meditation as a Mechanism for Mind-Body Well-being

Whilst research is emerging regarding mindfulness as an effective support for EA university students, understanding of the facets and mechanisms via which mindfulness promotes mind-body well-being in this population in emerging. There are limited validated resiliency models and frameworks examining mindfulness meditation as a catalyst for change

in this population. Current proposed models and frameworks pertaining to this population suggest changes in stress occur via present-moment attention on experience. It is generally argued the meditator disengages from thought streams, allowing for increased psychological space and awareness (Garland et al., 2015). These theories and models suggest that increased psychological space is the mechanism by which self-regulation and awareness occurs, enabling response flexibility, rather than reactively engaging in habitual response patterns (Bishop et al., 2004). Similarly, Seigel (2012) describes response flexibility as the ability to pause before responding to events as an essential component of emotional and social intelligence. It is the process of becoming fully aware of what is taking place internally, and externally and restraining impulses long enough to consider various options for response (Seigel).

Mindsight and Integration

Seigel (2010), describes the mind as an embodied and relational process and introduced the concept of "mindsight" to describe the process of looking within, perceiving the mind and reflecting on experience, as being an essential component to well-being. Siegel describes this process as "a uniquely human ability, mindsight allows us to examine closely, in detail and in depth, the processes by which we think, feel, and behave. And it allows us to reshape and redirect our inner experiences so that we have more freedom of choice in our everyday actions, more power to create the future, to become the author of our own story. Another way to put it is that mindsight is the basic skill that underlies everything we mean when we speak of having social and emotional intelligence (p. 10)".

Promoted via mindfulness meditation practices, mindsight is suggested to offer the opportunity to explore the subjective essence of who we are as individuals and create a life of deeper meaning with a richer and more understandable internal world. This process promotes emotional balance, facilitates body and brain homeostasis, and improves relationships with others and us (Seigel, 2010). Like previously outlined research, Siegel also suggests this ability to focus attention on the internal world reshapes neural pathways, stimulating the growth of areas of the brain that are crucial to mental health. Neuroscience supports the idea that developing the reflective skills of mindsight activates the very circuits that create resilience and well-being and that underlie empathy and compassion. Neuroscience has also definitively shown the brain can re-wire across the lifespan (Seigel, 2010).

As discussed above, adaptation and capacity to remain in homeostasis during personal change and stress throughout life is dependent on the width of an individual's Window of

Tolerance (Seigel, 2010). This concept is aligned with the concept of integration; a process of separate components linked together as a whole. When experiences push individuals outside this window, they fall into patterns of emotional coping and response that are described as either ridged (e.g., depression, cut-offs, avoidance) or chaotic (e.g., agitation, anxiety, rage; Seigel, 2012). Promoting integration within components of the mind and body enable the Window of Tolerance to widen promoting well-being and resilience. Mindsight alters the way the mind functions resulting in changes to an individual's internal and external life. Mindsight enables the focus of the mind in ways that can promote integration within the brain, moving the individual towards greater resilience and health (Seigel, 2012).

When homeostasis is disrupted, one important component needed is appropriate knowledge and skills to regain this adaptive function. Siegel (2010) suggests the power of inner reflection that is at the heart of mindsight. Mindsight emerges as communication (with others and with the self) and assists to reflect on both inner experiences and identity. Seigel describes three specific components of reflection promoted via mindfulness meditation which form the foundation for the concept of mindsight: openness, observation, and objectivity. These are described below.

Openness – describes a receptivity to whatever experiences enter the individual's awareness with an emphasis on non-attachment to preconceived ideas and control. There is a "letting go" of expectations, and the capacity to receive experiences as they are. Openness promotes clarity and strengthens the capacity to recognise restrictive judgements and their impact (Seigel, 2010).

Observation – describes the ability to perceive the self with all the senses during the process of experiencing an event. This concept describes the capacity to hold a larger frame of reference and a broadened perspective in each present moment despite the experience. Self-observation provides a powerful way to disengage from habitual responses and automatic behavioural patterns, promoting insight and understanding into individual's roles within these patterns to facilitate adaptive change (Seigel, 2010).

Objectivity – describes the process of simply observing and experiencing a thought, feeling or sensation without becoming overwhelmed by it. This aspect is centred on the capacity of the mind to be aware that present moment experiences (e.g., thoughts, feelings, sensations, memories, beliefs, intentions) are temporary and are not the totality of an individual's identity or reality. This capacity is also associated with the concept of meta-awareness, described as the ability to be aware of being aware – a critical skill in promoting

adaptive response changes (Seigel, 2010). Seigel suggests that without these aspects, the ability to perceive with clarity the mind of self and others becomes compromised, narrowing the Window of Tolerance and making individuals more susceptible to experiencing rigidity and chaos during times of adversity.

Mindfulness to Meaning Theory and Positive Re-appraisal

Previous theories and models have proposed the mechanisms via which mindfulness meditation promotes resilience and well-being. With consensus on a focus and awareness of the present moment, it is argued that the meditator disengages from thought streams, allowing for increased psychological space and awareness (Farb et al., 2013). These theories argue that increased psychological space is the mechanism by which self-regulation occurs, enabling psychological flexibility in response to events, rather than reactively engaging in habitual response patterns (Bishop et al., 2004). As previously discussed, these findings have been supported by neuroscience for the benefit of increased integration of sensory information. The process of achieving psychological space has been defined as *decentering* within the mindfulness literature (Bishop et al., 2004)

Whilst repeated, sustained attention to the breath has been associated with strengthened capacity for decentering and sustained sensory attention (Farb et al., 2013; Rosenberg, 2020), attentional control and perceptual discrimination (Schmalzl et al., 2018) and eudaimonic well-being (Bauman, 2017), it remains unclear how repeated attention to physical sensation (such as breath) could enhance adaptive appraisals and meaning regarding self, others and the world during times of stress. That is, there are currently limited mindfulness models providing a theoretical perspective and evaluation of the process via which mindfulness cultivates specific resources and mechanisms associated with resilience. There is also limited application of such models to specific developmental stages, such as EA, which consider the unique developmental tasks and life cycle transition of this life stage. This appears critical to provide informed interventions designed to target such growth and adaptive meaning making.

Contemporary research conducted by Garland et al. (2015) provides a theoretical model deviating from the traditional scholarly focus on mindfulness as a form of strict, non-conceptual attention and non-judgemental awareness as a mechanism for change. These researchers propose that via the mechanism of reappraisal, mindfulness may generate eudaimonic meaning and foster flourishing in life. Garland et al. proposes that the practice of mindfulness evokes a metacognitive state that transforms how one attends to experience,

promoting positive reappraisals that facilitate positive affect and adaptive behaviour. Positive re-appraisal can be defined as a state which flows from mindfulness and involves broadening of scope for appraisal of events to appreciate that even aversive experiences are potential vehicles for personal transformation and growth (Garland et al., 2015). Specifically, *positive re-appraisal* is defined as a cognitive strategy and an adaptive process through which stressful events are reconstrued as benign, meaningful or even growth promoting (Lazarus & Folkman, 1984; Garland et al., 2015).

Indeed, the concept of positive re-appraisal has been observed throughout history in terms of an essential means of adaptation, growth and meaning in the face of small and large-scale adversity. For example, Folkman (1987) showed that partners and caregivers of those with HIV reported the shared experience of the illness promoted deeper intimacy, than if their partner had not experienced the illness. In the wake of a tornado that devastated Madison, Florida in 1988, over 90% of survivors reported a sense of benefit from the experience, including personal growth and increased connectedness to others and community (First et al., 2011; McMillan et al., 1997). Similarly, research conducted by Xu and Liao (2011) showed that more than half (51.1%, N=2,080) of survivors of the 2008 earthquake in Sichuan Province, China reported meaningful growth post event, including increased personal strength and appreciation for life Whilst these examples apply to large scale disaster, illness and relational adversity, the same potential can be applied to the everyday stressors of life. For example, aspects such as financial stress, academic pressure, moving house or changes to friendships all have the possibility for positive reappraisal and beneficial meaning making. Instead of these aspects being viewed as a perceived threat, they may be viewed as a challenge or hidden blessing providing an opportunity for flexibility and growth. In the context of the EAs, and particularly those engaged in university studies (including those at-risk populations), understanding how to promote positive re-appraisal may form a crucial component of resilience and the successful transition to both this developmental stage and adulthood.

Whilst research is beginning to evaluate how to promote positive re-appraisal in this population, models of mindfulness remain largely theoretical. Garland et al. (2015) proposed the Mindfulness to Meaning Theory, which has sparked debate among researchers valuing traditional contemplative models of mindfulness. Garland et al. (2015) suggests positive re-appraisal provides meaningful positive experiences in the face of stress that complement and

sustain the extinction of maladaptive cognitive habits. The researchers argue this process potentially improves appreciation for positive experiences generally.

The theory contends that a focus on positive experience should not be avoided within contemporary mindfulness training, providing the focus of these experiences does not involve the encouragement of clinging to such experiences. This new approach expands thinking and acknowledgement of the need to focus on the cultivation of positive mental states and emotions, rather than exclusively on reduction of distress, to provide a complete theory of mindfulness (Garland et al., 2015).

The Mindfulness to Meaning Theory suggests that by modifying how one attends to the cognitive, emotional, physical and affective experience, mindfulness introduces flexibility into the creation of autobiographical meaning, promoting the natural human capacity to positively re-appraise adverse events and savour positive experiences (Garland et al., 2015). By fostering positive re-appraisals and emotions, mindfulness may generate deep eudaimonic meanings that promote resilience and engagement with a valued and purposeful life (Garland).

Garland et al (2015) suggests that the capacity for mindful re-appraisal extends models of emotion regulation, providing an adaptive cognitive change strategy. Specifically, immediately following a stressor mindfulness attenuates negative attentional biases and maladaptive habits of response, allowing positive reappraisal to enter the potential emotion regulatory process, modulating the impact of a negative event. Over time, mindfulness enables reflective processes to increase affective benefits of positive reappraisal and generate eudaimonic well-being in an upward spiral process. More specifically, within the first stage mindfulness disrupts default activation of schemas and scripts to allow for flexible selection of appraisals. In this capacity, mindfulness interrupts automatic conditioned reactions, allowing for conscious reflection. By interrupting scripted defensive responses to an appraised stressor, it is possible to re-evaluate the context in which the initial stress appraisals are made. Thus, mindfulness provides a buffer from immediate, automatic reactivity, thereby clearing working memory (Teasdale & Chaskalson, 2011) and providing psychological space for greater perspective taking and decentering from thoughts, emotions, and sensations – shifting attention from the content to the process of experience – and setting the foundation for reappraisal (Garland et al., 2015).

Through decentering, mindfulness is proposed to promote deidentification from thoughts, emotions and narratives about self, others and the world, promoting flexible

selection of adaptive responses (Shapiro et al., 2006). The premises of this theory are that decentering is a form of psychological space, which facilitates: a) nonthreatening reflection of stressful events, b) increases openness to alternative viewpoints, fosters reasoning (Kross & Grossman, 2102), c) promotes fertile ground for constructive reframing of one's circumstances (Garland et al., 2015) and d) allows for adaptive and prosocial action leading to clearer life purpose and meaning. The researchers also contend that through acceptance of experience, mindfulness may be a key mechanism that underlies the therapeutic efficacy of reappraisal for promoting positive psychological outcomes (Garland et al., 2015).

This model provides a comprehensive explanation of how mindfulness cultivates psychological space and self-regulation skills; however, the complex nature of how positive re-appraisal is cultivated within an EA university population remains theoretical and worthy of further exploration. Furthermore, whilst the researchers suggest that acceptance of experience is cultivated, it appears that further understanding is needed to discern the relationship between acceptance of experience and positive reappraisal.

Overall, this model provides a contemporary perspective on the process and role of mindfulness in promoting the dual process of eudaimonic resilience, however the model still has gaps and remains theoretical in nature. Controversially, Garland et al., (2015) suggests that mindfulness and positive re-appraisal are not contradictory operations but rather distinct and complementary stages of a positive regulation process unfolding over time. They highlight that this process is yet to be fully specified and evaluated (Garland et al., 2015). Garland contends that the scope the Mindfulness to Meaning Theory and model is limited, and further research is needed. The next section outlines the relationship between mindfulness meditation and internal resources associated with resilience and psychological well-being.

Mindfulness Meditation and Psychological Flexibility

As evidence of mindfulness leading to brain plasticity has emerged, researchers have begun examining the concept of psychological flexibility across clinical and non-clinical populations (Marshall & Brockman, 2016). Psychological flexibility is an emerging construct in the field of positive psychology and has been proposed as a key therapeutic ingredient to psychological health (Kashdan & Rottenberg, 2010). The increasing rates of mental health issues among EAs has spurred interest in further understanding newer psychotherapeutic approaches to improve treatment efficacy and effectiveness (Marshall & Brockman, 2016). This movement toward improving and building on traditional Cognitive Behavioural Therapy (CBT) resulted in third wave behaviour therapy. Whereas the second wave of behaviour

therapy introduced the importance of negative meaning making processes (cognition) in the maintenance of clinical problems and integrated this with behaviour therapy principles to develop "CBT," third wave therapies emphasize the importance of how one relates to cognitions and emotions over the content (Pérez-Álvarez, 2012). The third wave includes approaches such as Acceptance and Commitment Therapy (ACT; Hayes et al., 2006) and Compassion-focused Therapy (CFT; Gilbert, 2009).

According to Relational Frame Theory (RFT; Hayes et al., 2006), *psychological flexibility* is defined as being consciously present and changing or persisting in valued behaviour (Hayes et al., 2006). RFT is one of the most researched third wave theories with more than 70 empirical studies (Hayes et al., 2006), including six components: mindfulness (contact with the present moment), defusion (detachment from thoughts), acceptance (nonjudgmental allowance of inner experience), self as context (observing self), values, and committed action. Conversely, psychological inflexibility is associated with emotional distress, including anxiety and depression (Hayes et al., 2006). The RFT of psychopathology posits that psychological inflexibility arises from unhelpful contextual control over cognition and language processes, where mental health is affected more by how individuals *relate* to their thoughts and feelings than their form (Hayes et al., 2006). This perspective contends psychological disorders share underlying core processes, including rigid and excessive attempts to avoid experiencing unpleasant or painful emotions and cognition. According to third-wave therapies, acceptance of unpleasant experience is more helpful than attempts to directly control inner events (Hayes et al., 2006).

Third wave therapies include mindfulness and psychological flexibility within conceptual frameworks (Hayes et al., 2011). In theory, the two processes are often conceptualised as adaptive self-regulation and coping processes that reflect greater psychological health (Chambers et al., 2009; Kashdan & Rottenberg, 2010). Although psychological flexibility and mindfulness are often considered similar but distinct processes, evidence supporting this conceptual position is still limited and further research is necessary (Kashdan & Rottenberg, 2010). Conceptually however, psychological flexibility and mindfulness reflect functional and process-based understandings of psychopathology. These two constructs reflect an overarching regulation process: how a person contacts and responds to their internal and external environments in the present moment, not necessarily what the person experiences (e.g., hopelessness or fear; Levin et al., 2012). Research has established associations between mindfulness and psychological well-being, and psychological flexibility

and well-being; with lower levels of both associated with increased risk for psychopathology (Kashdan & Rottenberg, 2010). This research has largely been based on the collection of self-report data in both clinical and non-clinical populations (Levin et al., 2012; Palladino et al., 2013).

To date, limited research has examined mindfulness and psychological flexibility within an EA university student population. A study conducted by Palladino et al., (2013) examined psychological flexibility in fourth year medical students (n =660), demonstrating significant positive correlations with self-reported levels of life satisfaction. Despite the article highlighting the importance of students engaging in MBIs designed to foster psychological flexibility, limited understanding is provided regarding the role of mindfulness in increasing psychological flexibility and resilience. Furthermore, this study did not specifically examine the constructs within an EA university population. As previously stated, the increasing rates of stress and psychological distress within this population suggest further research is needed understanding how to promote resilience. The current research will address this gap, by examining mindfulness meditation and psychological flexibility during this developmental period. EA provides a unique opportunity to capitalise on brain plasticity and promote flexible regulatory processes, to foster adaptive strategies and ways for relating to the self, others and world during times of stress. It is therefore essential to understand the relationship between mindfulness and psychological flexibility in both resilience and the role of these constructs within the new concept of EI.

Mindfulness Meditation and Self-compassion

Compassion is defined as our emotional response rather than a cognitive response to the recognised suffering in another and the authentic wish to relieve this suffering (Wolf & Sepra, 2015). *Self-compassion* is the same as compassion, but the recipient is oneself. Self-compassion is defined as being compassionate towards oneself; celebrating and enjoying oneself when life is going well and in the absence of stressors, as well as bringing a kind and forgiving perspective to oneself in the face of stress and adversity (Desmond, 2016). Self-compassion embodies the concept no matter what life events individuals encounter, they are loveable and believe this as an integrated sense of self (Desmond). Compassion towards self provides recognition that when life is functioning well, an individual has permission to feel joy. In the face of suffering and distress, the capacity for self-compassion becomes a kind and supportive internal voice, allowing individuals to be their own "care provider" – sending love, support and reassurance to the self (Desmond). In fact, increased self-compassion is associated with increased activation

of the mammalian care-circuit within the brain – releasing oxytocin and natural opiates to lift mood and promote feelings of warmth and connection (Desmond, 2016).

Neff (2003) suggests three components of self-compassion; 1) mindfulness (being aware of the pain), 2) shared humanity (recognising that suffering is a part of being human), and 3) self-kindness (being kind to oneself). More specifically, Neff (2003; 2015; 2016) describes self-compassion as composed of six interrelated facets and is the direct result of engaging in these three positive and adaptive facets, described below (see Table 17).

Table 17

Summary of Adaptive and Maladaptive Appraisal Components of Self-Compassion (Neff, 2003)

Adaptive Components of Self-Compassion	Opposite Maladaptive Appraisal
• Mindful attunement and acceptance of experience (positive and negative)	• Appraisals involving judgement of self and over-identification – resulting in rumination
• Appraising emotional difficulty as evidence of one's humanity	• Appraising events as personal failings – leading to isolation and withdrawal
• Actively cultivating and offering warmth towards the self during times of suffering	• Responding to challenging life events with appraisals of self-criticism

Furthermore, self-compassion has been conceptualised as both a trait and a psychological process that can be strengthened through intentional cultivation (Vigna et al., 2020). A review of empirical work suggests self-compassion promotes resilience to psychological distress by moderating the cognitive appraisal of, and physiological response to, negative and stressful events. As such, self-compassion may be a particularly effective coping response for disrupting the internalization of habitual, negative thought responses by offering kindness, warmth, acceptance and understanding of self during such times, rather than self-judgment and criticism, inability to cope, and rumination (Vigna et al., 2020).

Whilst self-compassion is a relatively new concept in western psychology, research has demonstrated that positive reappraisal impacts self-compassion, well-being, coping, and biomarkers related to stress as well as decreases in psychopathology. A meta-analysis conducted by MacBeth and Gumley (2012) found consistent results for increased self-compassion being associated with lower self-reported depression, anxiety, and perceived stress. Self-compassion has been shown to positively correlate with life satisfaction (Chew &

Ang, 2021), positive affect (Stutts et al., 2018), optimism (Namani & Bagherian Kakhki, 2019; Neff et al, 2007), and acceptance (Zhang et al., 2020). Self-compassion also supports increased health related behaviours such as cessation of tobacco use (Walter, 2019), alcohol use reduction (Brooks et al., 2012) as well as buffering negative outcomes in chronic pain patients (Costa et al., 2011) and reducing the negative emotional impacts and stress associated with illness (Brion et al., 2014).

Recent research also suggests self-compassion has a positive impact on biomarkers in the body associated with disease and ageing. Arch et al., (2014) demonstrated self-compassion training in women improved anxiety and cardiac responses in a stress situation, and reduced stress activation as measured by alpha-amylase, a salivary enzyme. Breines et al., (2014) also compared a stress-induced inflammation marker (interleukin-6) in the blood of healthy adults (n=40) following exposure to a standard laboratory stressor. Those with higher self-compassion had significantly lower levels of inflammatory markers, suggesting self-compassion may protect from inflammatory related disease.

A Randomised Control Trial (RCT) on the efficacy of an intervention for cultivating mindful self-compassion conducted by Neff and Germer (2013) demonstrated that compared to the control group, those in the intervention group reported increased self-compassion, mindfulness, compassion for others and life satisfaction and lower depression, anxiety and stress. These results suggest that interventions aimed to increase self-compassion produce meaningful health outcomes for both clinical and non-clinical populations (Wolf & Sepra, 2015).

Vigna et al. (2020) suggests that the first step in fostering self-compassion, involves remaining mindfully attuned and accepting of experiences of suffering (i.e., painful thoughts, feelings and sensations) as they arise, without over-identification and judgement, as occurs in rumination. Secondly, self-compassion involves appraising difficult experience (including thoughts, feelings and sensations) as evidence of one's common humanity and an integral part of being a human being, rather than an appraisal of personal failing leading to isolation. Finally, fostering self-compassion involves providing warmth, care and support to the self, rather than engaging in self-criticism (Vigna et al., 2020).

It is therefore evident that self-compassion plays a critical role in fostering adaptive appraisal during times of stress and adversity. A meta-analysis inclusive of EAs confirmed a negative correlation between self-compassion and anxiety and depression in both clinical and nonclinical samples, with moderate to large effect sizes (MacBeth & Gumley 2012), and a

positive correlation with psychological well-being (Zessin et al. 2015). Moreover, encouraging research suggests that self-compassion does protect adolescents from stress by moderating the cognitive appraisal of, and physiological response to, stressful events (Bluth et al. 2016; Breines et al. 2014). Further, intervention studies demonstrate that increases in self-compassion relate to reductions in perceived stress, rumination, and depressive symptoms (Bluth et al., 2016).

Mindfulness Meditation, Psychological Flexibility and Self-compassion

Despite research demonstrating support for the role of self-compassion in psychological well-being, few studies have examined this construct in relation to other adaptive components such as psychological flexibility and positive emotions in young people attending university. Neff et al., (2007) examined self-compassion in American university students (n=40). Results showed that self-compassion was negatively associated with maladaptive psychological functioning. Martin et al., (2011) found self-compassion was positively related to cognitive flexibility. Some limitations of these studies included a predominance of female participants and in one case a small sample size n= 40 (Neff et al., 2007). Only one study (Neff et al., (2007) performed regression analyses to provide interaction data between self-compassion and mindfulness in the prediction of emotional well-being. However, this included mindfulness only, excluding other aspects of psychological flexibility (e.g., defusion, acceptance). Van Dam et al., (2011) surveyed 504 participants, aged 18–73 years, showing self-compassion was positively correlated with mindfulness, and a stronger predictor than mindfulness of emotional distress.

Furthermore, research suggests that engagement in specific mindfulness meditation designed to increase self-compassion is also associated with increases in the experience of positive emotions (Fredrickson et al., 2008). A RCT of Loving Kindness Meditation (LKM) demonstrated that adult participants randomly assigned to a seven-week MBI reported significant increases in positive emotions relative to a control group (Fredrickson et al., 2008). Over the course of the study, participants were trained to induce positive emotional states. The longer participants spent meditating with the goal of inducing these positive states, the more intense these positive emotional states were. These increases in positive emotions were durable, persisting on days when participants did not meditate (Fredrickson et al, 2008).

This research provides modest evidence for the role of mindfulness meditation and self-compassion in fostering psychological flexibility and positive emotions. Skills in fostering a compassionate self-relationship are also needed to break maladaptive and

conditioned habitual patterns of appraisal in relating to the self and experience (Marshall & Brockman, 2016). In building upon previous research, this thesis contends that self-compassion also offers a tangible and comprehensive element and skill set for directly contacting with kindness painful emotion and sensation in the body during EA. It is argued that both these skills are needed to respond adaptively (Desmond, 2015; Marshall & Brockman, 2016).

Resiliency models integrating trait mindfulness and self-compassion as key mechanisms of top-down and bottom-up processes for well-being for EAs are essential. The capacity to know, love and forgive oneself during all stages of life is a critical component in understanding and ultimately releasing negative thoughts, perceptions and emotion attached to past events which surface in the present moment, impacting on resilience and functioning.

Mindfulness Meditation and Positive Emotions

Several studies provide evidence consistent with the proposition that positive emotions build durable personal resources (Gable et al., 2006; Garland et al., 2011). Evidence for an association between increased positive emotion and broadened cognition has been associated with enhanced creative problem solving and increased adaptive behavioural responses (Fredrickson & Losada, 2005; Rowe et al., 2007). These findings have been supported by studies using a range of research methods including behavioural measures (Fredrickson & Losada., 2005), eye-tracking (Wadlinger & Isaacowitz, 2010) and brain imaging(Schmitz et al., 2009). *Positive emotions* can be described as the experience of specific emotions measured by the Positive and Negative Affect Schedule including interested, excited, strong, enthusiastic, proud, alert, inspired, determined, attentive, and active (Rowe et al., 2007).

The relationship between positive emotion and broadened cognition forms the foundation for Broaden-and-Build Theory (Fredrickson, 2001; 2008), and has been tested in a wide range of observational, experimental, and clinical studies. In this theory, Fredrickson (2001) posits that recurrent experiences of positive emotions allow individuals to build a range of consequential personal resources. Fredrickson argues that the experience of positive emotions momentarily broadens the scope of an individual's attention and thinking. This broadened outlook,, leads to the development of personal resources, such as resilience. The authors chose to utilise LKM because of its affective focus and its emphasis on creating warmth and compassion for the self and others.

Using a non-clinical sample of computer software employees (n = 139) recruited through their workplace, Fredrickson et al., (2008) conducted a randomised control trial to

examine whether a LKM intervention would result in the increased experience of positive emotions and the subsequent development of personal resources, including resilience and mindfulness. This study was designed to test Fredrickson's (2004) Broaden and Build Theory of positive emotions.

Using structural equation modelling, Fredrickson and colleagues (2008) tested the "build" component of this theory by attempting to ascertain whether the experience of positive emotions led to an increase in personal resources. The authors found that, consistent with the Broaden and Build Theory, LKM led to increases in a range of positive emotions, which were in turn related to increases in a variety of personal resources, including resilience, self-acceptance and compassion, and mindfulness. Interestingly, Fredrickson and colleagues (2008) found that the intervention group initially reported lower levels of positive emotions after commencing meditation practice. Frederickson et al. hypothesised that this finding is reflective of the inherent difficulties in initiating any self-change effort. Commencing a meditation practice may be perceived by novice meditators as something unfamiliar, difficult and without immediate rewards. Kabat-Zinn (2005) identified five difficulties facing novice meditators: craving, anger, boredom, restlessness, and doubt. These difficulties are believed to result from an increased awareness of commonly present challenging inner states that were previously unnoticed prior to engagement in the meditative practice.

The capacity to hold both positive or elevated thoughts and emotions can have significant impacts on both psychological and physiological well-being. For example, the results of a study of 225 medical students who were followed over the course of a 25-year period showed those which were the most hostile were five times more likely to experience coronary heart disease (Cousins, 1979). Furthermore, Salovey et al., (2000) suggested that a positive outlook and experience of positive emotions may offer the strongest known protection against heart disease in adults at risk due to family history. Furthermore, in a study of heart health in 866 patients, those who reported routinely experiencing positive emotions had a 20 percent greater chance of being alive 11 years later than those who habitually experiences more negative emotions (Hayashi et al., 2007). These studies provide evidence for the importance of fostering knowledge and skills in enhancing mindsight and positive emotional experience as a strong component of both psychological and physical resilience across the lifespan.

Conclusion

This chapter reviewed contemporary theories and perspectives pertaining to the psychological and physiological aspects of resilience. Specifically, the neuroscience of resilience and understanding of the role of the PFC was outlined, with an emphasis of this developmental stage providing an opportune time to enhance PFC functioning. Greater PFC development is associated with less reactivity, increased emotion regulation and enhanced capacity for cognitive interpretations that are positive/beneficial (Williams et al., 2008). This research argues EA presents an opportune time to provide interventions aimed at re-wiring the brain for resilience.

The importance of understanding both neurological aspects, as well as systemic and developmental tasks was also reviewed and importance of supporting EAs in moving towards achieving self-differentiation as being indicative of resilience in this developmental phase. Social relationships and family life cycle transitions often provide challenging events and changes, and therefore opportunity for the development of "maturity" or self-differentiation and balance throughout life (Brown, 2012). The development of self-differentiation involves attributes such as emotional awareness and regulation skills, interpersonal awareness and resources, acceptance of self and others whilst staying healthily connected and being responsible for mature problem solving (Bowen, 1978; Brown, 2012). Self-differentiation is an evolving process of obtaining internal and external "balance" within social systems; of staying healthily connected to others and responding with resilience to life's stressors as an individual (Brown, 2012; Skowron et al., 2009).

This theory also integrates with neuroscience regarding resilience, as the skills required to facilitate self-differentiation require engagement of the PFC, enabling more constructive complex decision and meaning making throughout life (Davidson, 2012; Brown, 2012). The process of self-differentiation can be described as an essential task in the path to maturation requiring resilience, and is particularly salient to the EA, as they begin the transitional phase towards adult identity (Brown, 2012; Skowron et al., 2009).

A relevant framework for observing both psychological and physiological resilience was introduced via the Window of Tolerance and eight domains of integration (Seigel, 2010). This theory contends resilience during personal change is dependent on an individual's Window of Tolerance, reflecting their capacity or window to remain in homeostasis during such change. When demands exceed this window, either rigidity or chaos occurs internally and externally and are associated with stress and psychological distress (Seigel). Seigel also proposed eight

domains comprising integration as being key to personal transformation, resilience and well-being (see p. 98).

The concept of eudaimonic resilience was also discussed as a dual-process model of adaptation. On the one hand is affect regulation, and on the other is meaning regulation. Affect regulation involves the capacity to regulate positive and negative emotionality, notably the hedonic concerns of approaching pleasure and avoiding or escaping pain (Ryan & Deci, 2001). Meaning regulation involves the capacity to focus on, construct, and reconstruct meaning in one's life – that is, one's self-identity (Bauer & Park). This dual-process model of resilience is related to other dual-process models that focus on affect and meaning-making in self-identity development (Bauer et al., 2008; Labouvie-Vief, 2003; Staudinger & Kunzman, 2005).

To expand and consolidate these perspectives the current research proposed the new concept of EI, as a more comprehensive definition of resilience during EA. EI proposes that the process of fostering adaptive self-regulation, meaning making and wisdom during and following adversity involves integrated neurobiology and balanced, adaptive components of mind and body considered within the context of relational systems (Seigel, 2012; Brown, 2012). That is, where the individual is moving towards a differentiated sense of self within social spheres (Skowron et al., 2009; Bowen, 1978). This new concept integrates theories pertaining to resilience, neuroscience, systemic and developmental aspects of EA.

Mindfulness meditation was introduced as a key mechanism for promoting EI and resilience within the EA, with the benefits for symptom improvement, biological marker improvement and neuroplasticity discussed. Mindfulness meditation is proposed within this research as a foundation for the cultivation of several key mechanisms for mind-body wellbeing. Relevant and effective theories and mechanisms for the promotion of resilience and wellbeing resulting from mindfulness meditation were reviewed, including Mindsight and Integration (Seigel, 2010) and Mindfulness to Meaning Theory and the capacity for promoting Positive Re-appraisal. The role of mindfulness meditation as a mechanism for fostering other specific inner resources, including psychological and response flexibility, self-compassion, positive emotions was also outlined.

Overall, this chapter aimed to provide a foundation for the integration of several perspectives relevant to the EA. When reviewing both Mindsight and Mindfulness to Meaning Theory, the question of whether mindfulness alone creates the fertile ground for flexible perspective taking and positive reframing arises. This thesis contends that whilst mindfulness may foster decentring from thoughts, feelings and behaviours creating psychological space and

therefore the “fertile ground” for flexible perspective taking and reframing, the potential for an individual to experience positive re-appraisal and increased positive emotion is not guaranteed. More specifically, this thesis proposes that to accept both positive and challenging experience in life, and to find the “silver lining,” and the potential for growth and learning and therefore ultimately meaning and purpose on one’s life path, one must be able to cultivate self-compassion and embody a compassionate relationship towards all experiences during such times. This thesis aimed to highlight that an essential component of a comprehensive model designed to foster positive re-appraisal and the concept of EI, must consider the key role of self-compassion in addition to mindfulness.

Chapter 5 presents a new theoretical model, the MEI, to address these gaps. This model provides a theoretical foundation for the process via which mindfulness cultivates psychological flexibility, positive emotions and positive re-appraisal and how these aspects are associated with self-compassion and function as an expanding and reciprocal process. The model will be consolidated with theories of family and lifespan development and specifically applied to and evaluated with EAs engaged in university education in Australia. A comprehensive description of the MEI is presented in Chapter 5 explaining each stage and the integrated nature of the model and process itself over time. Chapter 5 also presents Study 2 which will evaluate the MEI with a sample of EA university students studying in Australia.

CHAPTER FOUR

STUDY TWO: EVALUATION OF THE MODEL OF EUDAIMONIC INTEGRATION WITH EMERGING ADULT UNIVERSITY STUDENTS

Chapter Overview

The results of Study 1 showed the important role of resilience in psychological well-being and both the perception and experience of stress among EA university students studying in different regions around the world. Study 1 also highlighted research gaps pertaining to the understanding of resilience in this population and the development of validated mindfulness-based models of resilience for EA. Given the unique social, political, developmental, and systemic factor faced by young people studying in different locations, these models and frameworks also appear important to study within specific regions.

The literature review in Chapter 3 also proposed an expanded definition of resilience, introducing the concept of EI. This chapter also outlined the role of mindfulness in cultivating resilience, introducing important underlying constructs associated with both resilience and the capacity for positive re-appraisal. Consolidating this research, the current chapter introduces a new theoretical model of resilience for an EA university population, the MEI. Study 2 evaluates the MEI with a sample of EA university students studying in Australia to assess the efficacy of the model as a guiding framework for the development of a pilot MBI with this population.

Model of Eudaimonic Integration

As previously outlined, the MEI is a longitudinal process model of mindful emotion regulation (both positive and negative) and quality and integration of relational systems (with self, others, and world), promoting response flexibility, positive emotions and compassion as a foundation for beneficial meaning making of life events and challenges, which in turn, fosters psychological well-being and resilience during EA. Depending on the application of the model to a specific population, the unique developmental tasks and impending/current life-cycle transition are also considered to provide guidance around the nature and context of specific stressors to inform appropriate intervention.

Below is a description of the phases of the MEI. However, it is important to note that the model is not intended to be linear in process, but rather describe a comprehensive and interwoven relationship between variables which over time, work in conjunction to foster expanding levels of EI within the individual and the systems which surround them. This

provides a guide or framework for the development of resiliency skills following interventions based on this framework.

Model of Eudaimonic Integration – Initial Phase

The practice of mindfulness meditation initially facilitates decentering from stress appraisals allowing the metacognitive state of mindfulness to unfold. This metacognitive state is embodied by a non-judgemental attunement and awareness to present moment experience, creating psychological space which facilitates reduced automatic, unconscious, reactive, and habitual cognitive coping (including avoidance and rumination). Cultivating the state of mindfulness during negative affective state following stress appraisal activates the PFC (Chiesa & Serretti, 2009), which facilitates metacognitive monitoring of emotional reactivity, disengagement from negative, habitual appraisals and regulates the limbic system (Garland et al., 2015; Seigel, 2012). This disengagement may free processing resources within the PFC, implicating cognitive control mechanisms for attenuating emotional interference while allowing for psychologically flexible perspective taking regarding context and appraisals, based on memory and evaluated with reference to situational demands and the individual's autobiographical narrative. Gross (2015) and Seigel (2010; 2012) further support this theory by suggesting that optimal regulatory flexibility may require disengagement from self-referential processing via mindfulness, as a precursor to enable metacognitive reflection of experience and context when hedonic drives need to be balanced with eudaimonic goals and values (Mennin & Fresco, 2015).

Model of Eudaimonic Integration – Second Phase

Increased mindful metacognitive psychological space and flexibility is proposed to increase capacity for adaptive emotion regulation, the experience of positive emotions and positive meaning making (positive re-appraisal). Specifically, increased capacity for holding a positive semantic frame increases the perception of other positive events (Koivisto & Revonsuo, 2007). Increased capacity for positive re-appraisal may facilitate increased focus on beautiful, life-affirming and potential growth opportunities available from the current situation (Garland et al., 2015). Bonanno (2013) contends the ability to obtain positive meaning in adversity has been associated with the capacity to attend to positive information. Furthermore, past adversity predicts the capacity for savouring positive stimuli in the future – one of the most powerful predictors of amplifying positive emotion (Quoidbach et al., 2010). Dispenza (2014) also supports this notion, by suggesting that the ability to maintain positive

cognitions and emotions (i.e., attend to positive information) has profound beneficial impacts on both psychological and physiological well-being.

Increased mindfulness, flexible perspective taking, and positive emotion regulation and attentional capacity is proposed to enhance and broaden capacity for relating to the self, others and world in a positive and compassionate way. Specifically, the MEI contends that these elements provide a foundation for enhancing the innate capacity for self-compassion, with self-compassion contributing significantly to the ability for positive re-appraisal. Compassion skills go beyond simple awareness of inner experience and provide a vital *relational skill set* for sitting with and accepting painful experiences during adversity with love and kindness. Such skills and perspective of self, others and world also work to reciprocate and enhance experience of positive emotions by providing permission to experience and savour the joys of life. In this way, self-compassion provides a key aspect of EI by providing an adaptive relational perspective for relating to self and experience, allowing beneficial meaning making and therefore growth to be considered as part of the human condition.

Model of Eudaimonic Integration – Third Phase

The MEI proposes that during the third phase beneficial meaning making during and after adverse experiences is enhanced and supported via an interwoven process. Specifically, through an ongoing and evolving relationship between mindful metacognitive awareness and regulation, psychologically flexible perspective taking and response, increased capacity for positive emotion and positive attunement to experience and compassionate relationship with self, others and the world. Engagement in positive re-appraisal is in turn proposed to reciprocate and enhance self-compassion and experience of positive emotions. It is proposed that this ongoing and expanding process embodies the dual process of eudaimonic resilience. Engagement in these skills and processes is proposed to wire or re-wire the brain for growth and successful adaptation during EA – moving the young person over time towards successful self-differentiation and functional adulthood.

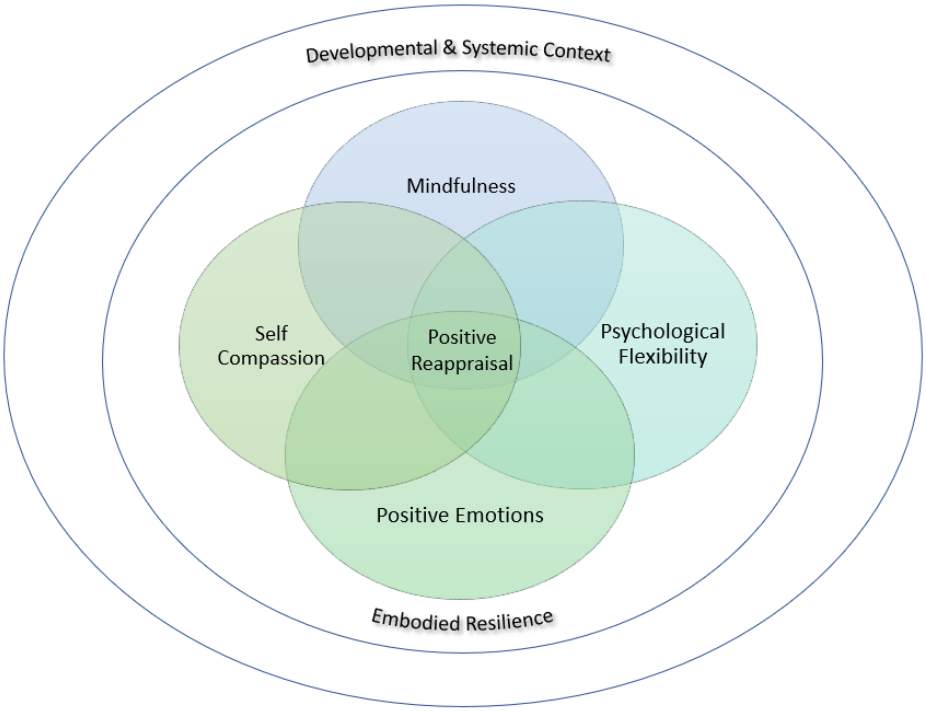
Model of Eudaimonic Integration – Phase Four

The ongoing, reciprocal and expanding nature of these resources and skills over time embody the concept of EI proposed in this research. It is suggested that engagement in such resources and adaptive ways of relating to the world with commitment and practice over time, transforms to trait levels of each construct which together form EI. Specifically, the process of EI provides a guiding framework for achieving balance and mind-body homeostasis; without

falling into extremes of maladaptive coping (e.g., chaos and rigidity; Siegel, 2010; 2012) and moving towards a meaningful and purposeful life. With specific application to the EA, this model provides a framework for moving towards self-differentiation; of learning to be meaningfully and healthily connected to others, whilst forming independent identities and being adaptively autonomous despite life circumstances. Figure 4 below is a graphical depiction of the MEI with theoretical foundation. Figure 5 shows a graphical depiction of the MEI showing hypothesised relationships between variables comprising embodied resilience and associated outcomes.

Figure 4

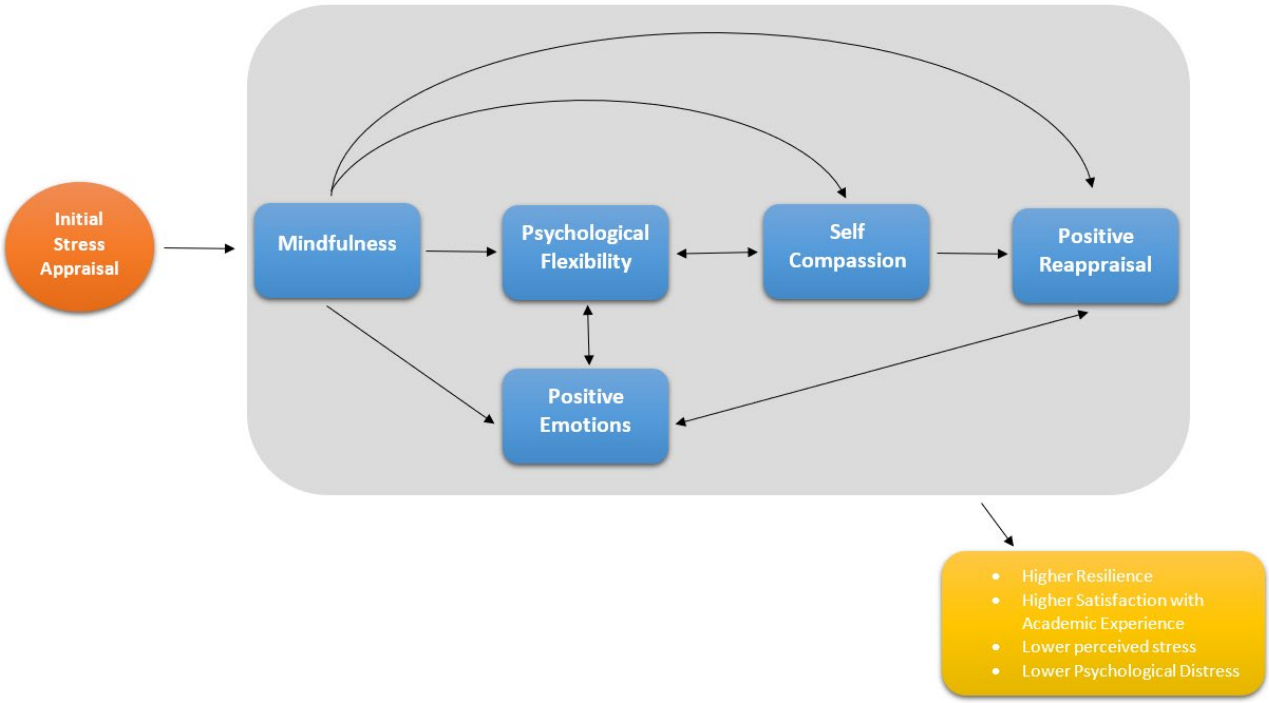
Model of Eudaimonic Integration



Note. A graphical depiction of the MEI. A longitudinal process model of mindful emotion regulation (both positive and negative) and quality and integration of relational systems (with self, others and world), promoting response flexibility, positive emotion regulation and compassion as a foundation for beneficial meaning making of life events and challenges, which in turn, fosters eudaimonic resilience, growth and personal potential during EA.

Figure 5

Model of Eudaimonic Integration Showing Relationships between Variables



Note. A graphical depiction of the MEI showing hypothesised relationships between variables comprising Resilience and associated outcomes.

Model of Eudaimonic Integration – Theoretical Foundation

Mindfulness to Meaning Theory (Garland et al., 2015)

Mindsight/Eight Domains of Integration (Seigel, 2012)

Broaden and Build Theory (Fredrickson, 2004)

Bowen Family Systems Theory (Bowen, 1978)

Relational Frame Theory (Hayes et al., 2006)

Appraisal and Coping Model During Transition to University (Dvorakova et al., (2018)

Study 2 aimed to extend the literature pertaining to the cultivation of mindfulness, resilience, and self-compassion during specific developmental periods by evaluating the validity of the newly proposed MEI with an EA university population studying in Australia. This research aimed to provide empirical evidence for relevant mechanisms and processes underpinning positive re-appraisal, resilience and psychological well-being in this population,

providing support for the new concept of EI. The evaluation of the MEI will provide empirical evidence for a resiliency model to address the increasing rates of stress and psychological distress identified in the Australian EA university student population, providing a framework to guide and inform MBIs with this population.

The current study explored, both conceptually and empirically, the strength of the direct causal relationships and association between variables within the model. This study is unique in that a path model of this nature has not been previously tested, and limited research has examined these variables within an Australian EA university population. This study evaluated the MEI by examining the process via which mindfulness, psychological flexibility, self-compassion, and positive emotions were direct predictors and correlated with the capacity for positive re-appraisal. The relationships between the underlying mechanisms within the model, and additional outcome variables of resilience, satisfaction with academic experience, perceived stress and psychological distress were also examined. Hypotheses are divided into three sections, with Part A pertaining to correlational relationships between variables, Part B pertaining to Model 1 and Part C pertaining to Model 2 (see pages 132 and 136).

Model 1 aimed to evaluate the role of mindfulness as a predictor of the underlying mechanisms within the MEI and evaluate this newly developed model by examining the predicted direct causal and correlational relationships among variables in the model. Part C of the study further evaluated the MEI via Model 2, to provide more specific information regarding the ways in which mindfulness cultivates mechanisms within the MEI. Model 2 examined the FFMQ subscales separately to determine the strength and direction of each subscale as predictors of psychological flexibility, self-compassion, positive emotions, and positive re-appraisal. Whilst Model 1 aimed to establish the role of mindfulness as a predictor of underlying mechanisms within the MEI, Model 2 was considered essential to determine facets of mindfulness associated with each variable, providing valuable information regarding the development of MBIs with EA university students.

Hypotheses

Hypotheses: Part A

Part A of the study examined the intercorrelations among variables to provide support for subsequent analyses to evaluate the MEI.

1. Hypothesis 1 predicted that resilience would be significantly positively correlated with mindfulness, self-compassion, positive emotions and positive re-appraisal. Resilience

was predicted to be significantly negatively associated with psychological inflexibility.

2. Hypothesis 2 predicted that SAE would be significantly positively correlated with mindfulness, self-compassion, positive emotions, and positive re-appraisal. SAE was predicted to be significantly negatively associated with psychological inflexibility.
3. Hypothesis 3 predicted that perceived stress would be significantly negatively associated with mindfulness, self-compassion, positive emotions and positive re-appraisal. Perceived stress was also predicted to be significantly positively associated with psychological inflexibility.
4. Hypothesis 4 predicted that psychological distress would be significantly negatively associated with mindfulness, self-compassion, positive emotions and positive re-appraisal. Psychological distress was also predicted to be significantly positively associated with psychological inflexibility.

Hypotheses: Part B

Part B of the study evaluated the MEI by examining the predicted direct causal and correlational relationships among variables in the model.

5. Hypothesis 5 proposed mindfulness would be a significant positive predictor of self-compassion, positive emotions and positive re-appraisal, where higher mindfulness would predict higher self-compassion, positive emotions and positive re-appraisal. A significant negative association was predicted between mindfulness and psychological inflexibility, where higher mindfulness is a predictor of lower psychological inflexibility, suggesting that mindfulness increases *psychological flexibility.*
6. Hypothesis 6 proposed that self-compassion would be a significant positive predictor of positive re-appraisal, where higher self-compassion predicts higher positive re-appraisal.
7. Hypothesis 7 proposed that psychological inflexibility would be a significant negative predictor of positive re-appraisal, where higher psychological inflexibility is a predictor of lower positive re-appraisal, suggesting higher *psychological flexibility* predicts higher positive re-appraisal.
8. Hypothesis 8 predicted that positive emotions would be significantly positively correlated with self-compassion and positive re-appraisal, suggesting higher positive emotions is associated with higher self-compassion and positive re-appraisal. Positive emotions were predicted to be significantly negatively correlated with psychological

inflexibility, suggesting that higher positive emotions are associated with higher *psychological flexibility.*

Hypotheses: Part C

Part C of the study further evaluated the MEI via Model 2, to provide more specific information regarding the specific ways in which mindfulness cultivates specific mechanisms within the MEI. Specifically, Model 2 examined the Five Facet Mindfulness Questionnaire (FFMQ) subscales separately to determine the strength and direction of each subscale as predictors of psychological flexibility, self-compassion, positive emotions and positive re-appraisal. Whilst Model 1 aimed to establish the role of mindfulness as a predictor of underlying mechanisms within the MEI, Model 2 was considered essential to determine facets of mindfulness associated with each variable, providing valuable information regarding the development of MBIs with EA university students.

9. Hypothesis 9 proposed the five FFMQ subscales; 1) Observing, 2) Describing, 3) Acting with Awareness, 4) Non-judging of Inner Experience and 5) Non-reactivity to Inner experience would be significant positive predictors of self-compassion, positive emotions and positive re-appraisal.
10. Hypothesis 10 proposed the five FFMQ subscales; 1) Observing, 2) Describing, 3) Acting with Awareness, 4) Non-judging of Inner Experience and 5) Non-reactivity to Inner experience would be a significant negative predictor of psychological inflexibility, suggesting that higher levels of these subscales are associated with higher *psychological flexibility.*

Method

Participants

EA university students studying in Australia (n=420) aged 18 to 29 years (M =21.63, SD =3.14) participated in the study. Table 18 presents the demographic data for gender, highest education level, university status, current residence, employment status and concerns regarding capacity to fund university studies that year.

Table 18

Descriptive Statistics for the Study Sample (n = 420)

		Count	Layer N %
Gender	Male	130	31.0%
	Female	289	68.8%
	other	1	0.2%
Highest education level	Completed Year 10	5	1.2%
	Completed Year 12	266	63.3%
	Undergraduate Degree	128	30.5%
	Postgraduate Degree	21	5.0%
University Status	Full-time	377	89.8%
	Part-time	43	10.2%
	On-Campus	96	22.9%
Current residence	Family Home	136	32.4%
	Off Campus Accommodation	131	31.2%
	Own Home	57	13.6%
Employment status	Full-Time (30+ Hours)	24	5.7%
	Part-Time (15-30 Hours)	88	21.0%
	Casual (1-15 Hours)	132	31.4%
	Not Working	176	41.9%
Concerns regarding funds	Yes	130	31.0%
	No	290	69.0%

The number of females (n = 289, 68.8%) was higher compared to the number of males (n = 130, 31%) in the current sample. This was representative of the Australian university sample with a total of 58.74% of students enrolled in Australian universities in 2018 identified as women, compared to 41.17% of male students (Department of Education, Skills, and Employment – Higher Education Statistics Data Cube uCube; 2018). Most participants had completed Grade 12 (n = 266, 63.3%) and attended university at full-time capacity (n = 377, 89.8%). Regarding employment status, nearly half were not working (n = 176, 41.9%)

which was higher than the number of students who reported working on casual basis (n = 132, 31.4%).

Convenience sampling was utilised for the recruitment of participants, with the current study collecting data from university students from Bond University Australia. Information and a link to complete the study was advertised via the universities online research portal. Participants included in the current study were fluent in English. All participants were required to meet inclusion criteria; over 18-29 years of age and currently enrolled in university study. There were no specific exclusion criteria for the study.

Materials

The questionnaire package included the following: Consent Form and Explanatory Statement, as well demographic questionnaire and process and outcome measures (see Appendix B and H). The questionnaire was administered solely online via the online survey program Survey Monkey (https://www.surveymonkey.com/).

Demographic Questionnaire

Participants were asked to provide information regarding gender, age, highest education, employment, current living situation and any concerns about funding university studies that year.

Process Measures

Five Facet Mindfulness Questionnaire (Baer et al., 2006). The FFMQ (Baer et al., 2006) is a 39-item self-report instrument developed to assess the general tendency to be mindful in everyday life. Participants indicated the frequency with which each statement describes themselves on a five-point Likert scale ranging from 1 = never or very rarely true to 5 = very often or always true. The scale comprises five subscales: Observing, Describing, Awareness, Non-judging of inner experience, and non-reactivity to inner experience. Sample items include: “I pay attention to how my emotions affect my thoughts and behaviour” (observing); “I can easily put my beliefs, opinions, and expectations into words” (describing); “I rush through activities without being really attentive to them” (acting with awareness; reverse scored); “I tell myself I shouldn’t be feeling the way I’m feeling” (non-judging of inner experience; reverse scored); and “I perceive my feelings and emotions without having to react to them” (non-reactivity to inner experience). The authors suggest examining each subscale separately for analysis, however numerous studies have demonstrated sound psychometric properties by utilising a total mindfulness score, calculated by summing subscale totals (e.g., Garland et al., 2011). The facet scales have shown adequate to good

internal consistency, with Cronbach's alpha coefficients ranging from .75 to .91 (Baer et al., 2008). Consistent with previous research, both the total FFMQ score, and individual subscales were examined. Table 19 below presents the mean value of Cronbach's α for each subscale and total in the current study.

Table 19

Number of Items and Cronbach's Alpha for Continuous Variables

Variable	*α*
Observe Subscale	.80
Describe Subscale	.88
Awareness Subscale	.89
Non- judgement Subscale	.90
Non-reactivity Subscale	.79
Mindfulness (FFMQ; total)	.90

The Acceptance and Action Questionnaire (Bond et al., 2011). The AAQ-2 (Bond et al., 2011) is a 7-item self-report scale that measures psychological inflexibility. Participants rate the degree to which worry, and emotional distress interferes with their life. Items are rated on an 8-point scale ranging from 0 = (never true) to 7 = (always true), with higher scores indicating higher psychological inflexibility and lower scores indicating greater psychological flexibility. Sample items include "I worry about not being able to control my worries and feelings," and "Emotions cause problems in my life." Mean reliability has been reported as .84 in postgraduate and community samples (Bond et al., 2011). The AAQ-2 has also been shown to have satisfactory validity and appears to measure the same construct as the Acceptance and Action Questionnaire-I (AAQ-1; r 5 .97), but with better psychometric consistency. The mean value of Cronbach's α in the current study was .91.

The Self-Compassion Scale (Neff, 2003). The SCS is a 26-item self-report scale measuring six facets of self-compassion for individuals 14 years and older: self-kindness, self-judgment, common humanity, isolation, mindfulness, and overidentification. Participants rate their level of self-compassion with items rated on a 5-point scale ranging from 1 = (almost never) to 5 = (almost always). Sample items include "I try to be loving towards myself when I'm feeling emotional pain" and "I'm disapproving and judgmental about my own flaws and inadequacies." Subscales are computed separately prior to reverse scoring. For computation of total self-compassion score, self-judgement, isolation and overidentification subscales are reverse scored and then all items combined for a total score. The scale has demonstrated strong reliability with Cronbach's alpha reported to be .86 (Neff et al., 2019). The scale has also been

shown to have satisfactory validity (r = .98; English version; Raes et al., 2019). The mean values of Cronbach's α in the current study was .93.

Positive and Negative Affect Schedule (Watson et al., 1988). The PANAS consists of two 10-item mood scales and was developed to provide brief measures of positive affect (PA) and negative affect (NA). The items were derived from a principal components analysis of Zevon and Tellegen's (1982) mood checklist; it was argued that this checklist broadly tapped the affective lexicon. Respondents are asked to rate the extent to which they have experienced each emotion within a specified time period, with reference to a 5-point scale. Items are rated as: 1 = 'very slightly or not at all' = 2, 'a little' = 3, 'moderately' = 4, 'quite a bit = and 5, ='very much'. Sample items include Proud, Hostile, Excited, Inspired, Afraid, Guilty.

Several different timeframes have been used with the PANAS. In the current study the timeframe adopted was 'during the past week'. Reliability and Validity reported by Watson (1988) was moderately good. For the Positive Affect Scale, the Cronbach alpha coefficient was .86 to .90; for the Negative Affect Scale, .84 to .87. Over an 8-week period, the test-retest correlations were .47-.68 for the PA and .39-.71 for the NA. The PANAS has strong reported validity with such measures as general distress and dysfunction, depression, and state anxiety (Crawford & Henry, 2010). The mean value of Cronbach's α in the current study were Positive Affect Scale = .90 and Negative Affect Scale = .86.

Cognitive Emotion Regulation Questionnaire (Garnefski et al., 2001). The CERQ assesses ways individuals cognitively cope with negative life events. The CERQ consists of 36 items that assess how often certain cognitive strategies are employed to cope with stressful life events. Participants respond on a five-point Likert scale ranging from 1 = almost never to 5 = almost always. The scale measures nine cognitive emotion regulation strategies including positive re-appraisal, acceptance, self-blame, positive refocusing, refocus on planning, putting into perspective, rumination, catastrophising and blaming others (Garnefski et al., 2001). Consistent with previous research (Garland et al., 2011), the positive-reappraisal subscale of the CERQ was used to measure positive re-appraisal. The positive reappraisal subscale includes items such as "I think I can learn something from the situation," and "I think I can become a stronger person as a result of what happened." Higher scores indicate higher engagement in positive re-appraisal as a cognitive coping strategy. Previous research has demonstrated the CERQ to have good internal consistency, with a Cronbach's Alpha = .85 (Garland et al., 2011). Adequate convergent validity has also been demonstrated with subscales of the Symptom

Checklist-90 (Garnefski et al; Garnefski & Kraaij 2007). The mean value of Cronbach's α in the current study was .92.

Additional Outcome Measures

Perceived Stress Scale (Cohen et al., 1983). The PSS is a 10-item self-report questionnaire that assesses the extent to which an individual appraises life events as stressful within the last week (Cohen et al., 1983; Lavoie & Douglas, 2012). The scale has been developed for use in community samples and has been normed on 3000 adults from the general population in North America and is recommended for use in individuals with a minimum secondary school level education (Lavoie & Douglas, 2012). The PSS is utilised internationally as the most widely used psychological instrument for measuring perceptions of stress (Lavoie, & Douglas, 2012). Participants respond to items on a 5-point Likert scale ranging from 0 = never to 5 = very often. Example of items include, "In the last week, how often have you felt nervous and stressed?" and "In the last week, how often have you felt you were on top of things?" A total perceived stress score is obtained ranging from a low of 0 to a theoretical high of 40. Higher scores indicate higher levels of perceived stress. Sound psychometric properties have been demonstrated for the measure, including high reliability (Cronbach's alpha = .93) and validity of the PSS (Kalaldeh & Shosha, 2012). The mean value of Cronbach's α in the current study was .87.

The Depression Anxiety Stress Scale (Lovibond & Lovibond, 1995). The DASS-21 is a 21-item self-report questionnaire that assesses symptoms related to the negative emotional states of depression, anxiety, and stress in both clinical and non-clinical populations aged 12 years and over (Lovibond & Lovibond, 1995). Participants are required to answer each item on the three sub-scales in terms of how often it has applied to them over the previous week. Respondents rate each item using a four-point Likert scale ranging from; 0 = did not apply to me at all to 3 = applied to me very much, or most of the time. Scores for each scale are calculated through the summation of items. The score range for each scale is 0 to 21 with higher scores on each scale indicative of higher scores of depression, anxiety and stress. However, Crawford and Henry (2005) proposed a four-factor solution where the three distinct scale items load onto a fourth factor, being general psychological wellbeing. In line with Crawford and Henry's (2005) proposition, the current study utilised this theory to combine depression, anxiety, and stress to comprise one variable, psychological distress.

The depression scale contains seven items designed to assess inertia, dysphoria, devaluation of life, hopelessness, self-deprecation, and anhedonia. Sample subscale items

include “I couldn’t seem to experience any positive feeling at all.” The anxiety scale contains even items designed to measure autonomic arousal, anxious affect, situational anxiety and skeletal muscle effects. Sample subscale items include, “I was worried about situations in which I might panic and make a fool of myself.” The stress scale examines chronic levels of arousal related to stress. Sample subscale items include, “I find it hard to wind down.”

Research has established the DASS-21 as a reliable and valid measure of depressive, anxiety and stress symptoms (Coker et al., 2018). A study conducted by Kia-Keating et al (2017) examined the validity of the DASS-21 as an effective screening tool with EA undergraduate students. Results supported use of the DASS-21 as part of an efficient universal monitoring assessment of college students’ mental health and well-being. As a robust measure of general distress with strong psychometric properties, the researchers recommended the DASS-21 as an effective and brief assessment of mental health in university counselling centres, health clinics and, with growing attention to empirically assessing quality of care, to monitor the effects of campus wellness programs (Sinclair et al., 2012).

Construct validity has also been established with confirmatory factor modelling revealing the hypothesised three factors structure was an optimal fit to the model, demonstrating the DASS-21 is comprised of the psychological constructs of depression, anxiety and stress (Sinclair et al., 2012). The mean value of Cronbach’s α in the current study were Stress subscale = .86, Anxiety Subscale = .80, Depression Subscale = .87 and Total = .92.

The Resilience Scale (Wagnild & Young, 1993; Wagnild, 2009). The RS was developed to evaluate the levels of resilience in the general population. Its reduced version (RS-14) has presented reliable internal consistency and external validity (Wagnild, 2009). The RS measures the degree of individual resilience, with the author’s describing the scale as a potential measure of internal resources and of the positive contribution of what one brings to a difficult life event (Wagnild & Young, 1993). The RS-14 is a self-rating scale that measures individual resilience in any setting. The scale items are scored on a 7-point scale from 1 = (strongly disagree), to 7 = (strongly agree). The RS measures five core domains of resilience, including equanimity, perseverance, self-reliance, meaningfulness, and existential aloneness. Sample items include, “my belief in myself gets me through hard times” and “”my life has meaning.” Psychometric evaluation supports the internal consistency reliability and concurrent validity of the scale (Wagnild & Young, 1993). Assessment of psychometric properties of the RS showed Cronbach’s alpha coefficients between .89 and .92 across different ethnic samples (Damsao, 2011, Wagnild, 2009, Pritzker & Minter, 2014).

In a systematic review of resilience measurement scales that included specific measures applied to adolescents (Windle et al., 2011) criticisms were raised to some of the measures, including the RS, in respect to the fact that the adolescents target group was not involved with the item selection. Some authors recommend more rigorous approaches to content validity (Streiner & Norman, 2008). Despite this criticism, the RS obtained one of the highest scores on overall quality, content validity, construct validity and overall internal consistency and interpretability with younger populations (Windle et al., 2011). The RS was the first instrument developed to study resilience and one of the most used in research (Pinheiro & Matos, 2012).

Convergent validity was demonstrated by significant positive correlations between the two measures of resilience (RS and RS-14) and flourishing and divergent validity was demonstrated by significant negative correlations with anxiety and depressive symptoms. The higher associations were obtained between resilience and flourishing and depression. Wagnild and Young (1993) also demonstrated the convergent and divergent validity of RS-14 with life satisfaction and depressive symptoms. The RS was therefore determined to be an appropriate instrument to use for the study of resilience in an EA population due to the psychometric properties of the instrument and its applications in a variety of settings and populations. The mean value of Cronbach's α in the current study was .80.

The Satisfaction with Academic Experience Subscale (Nora, 2004). The 5-item SAES forms part of the larger Survey of Student Attitudes and Behaviours Influencing College Choice (Nora, 2004). The subscale is a measure of student satisfaction with academic experience, and assesses satisfaction with classroom experiences, interactions with staff and preparation for the future based on personal expectations (Nora, 2004). Students are asked to rate the degree to which they agree or disagree with statements that reflect their level of satisfaction with their academic experience (e.g., My classes are appropriately challenging). Items were scored on a 5-point Likert Scale from 1 = strongly disagree, to 5 = strongly agree. Scores on the SAES range from 5 to 25, with higher scores indicating higher satisfaction with academic experience. The SAES has demonstrated sound psychometric properties, with Cronbach's alpha coefficients, ranging from .77 to .82 (Nora). Additionally, the SAE has demonstrated adequate construct and content validity. The SAES has been found to predict student persistence or departure from university (Nora). The mean value of Cronbach's α in the current study was .8.

Procedure

Ethical approval was obtained from Bond University Human Research and Ethics Committee (BUHREC) for the current study and was designed in accordance with the National Health and Medical Research Council (NHMRC) National Statement on Ethical Conduct in Human Research. Participants were from Australia and were obtained via advertisements on the Bond University research board and participant pool. Bond University psychology students were offered a course credit of 1% for their participation. The web-based questionnaire link was distributed to participants electronically and accessed online via Survey Monkey (https://www.surveymonkey.com/). All participation was considered voluntary, with informed consent being obtained electronically on the first page of the questionnaire. The informed consent process contained the Explanatory Statement, including information assuring response confidentiality. The questionnaire took approximately 30 minutes to complete.

Design

Below is an outline of the statistical analysis used for the study. Analyses were conducted using IBM SPSS Statistics (Version 21) and structural equation modelling was completed using AMOS (Version 22). Preliminary data analyses were performed to assess the accuracy of data input. Parametric data screening was conducted, and reliability analysis was performed on scales used within the study. Descriptive statistics of research variables, assumption testing and intercorrelations among research variables were determined.

Structural Equation Modelling

Two models were assessed through the current study:

1- Model 1: A more parsimonious model which was used to assess the association between mindfulness, psychological flexibility, self-compassion, positive emotions, and positive re-appraisal. This model examined mindfulness computed as a total score.

2- Model 2: A less parsimonious model in which the five subscales of mindfulness were examined separately. Specifically, this model assessed the association between the five subscales of the FFMQ (Observing, Describing, Awareness, Non-judging of Inner Experience, and Non-reactivity to Inner Experience) with psychological inflexibility, positive emotions, self-compassion, and positive reappraisal.

Structural equation modelling was used to assess the fit hypothesized models. Parameters were estimated using maximum likelihood (ML). Causal relationships were assessed using regression while association between variables was assessed through correlation. Regression

coefficients were assessed for significance using two-tailed Z test (Leech et al., 2005). Variables were scaled prior to the analysis to facilitate comparing the effect of various independent variables through regression coefficients. The overall model fit was assessed using the following indices:

A. C_{min}/df
B. The root mean square error of approximation (RMSEA)
C. The Tucker–Lewis index (TLI)
D. The comparative fit index (CFI)
E. The standardized root mean square residual (SRMR)
F. P_{close}

The lower bound of good fit for the TLI and the CFI is .90. For the RMSEA and the SRMR, the upper bounds for good fit are .08 and .10, respectively. C_{min}/df less than 5 was considered an indication of good model fit. These cut off criteria for model fit were used as previously defined (Hu & Bentler, 1999). Hypotheses were tested using structural equation modelling (SEM).

Comparing the Effect of Independent Variables

Standardized coefficients were used to compare the effects of the independent variables included in the SEM (PC, AL and EL). The standardized coefficients divide the size of the effect by the relevant standard deviations. So instead of being in terms of the original units of X and Y, the standardized regression coefficients are in terms of standard deviations which facilitates comparing regression coefficients. The R^2 is the squared multiple correlation and was used to assess the proportion of variance in the dependent variable that is explained by the independent variables.

Results

Preliminary Analysis

Prior to the main analyses, the dataset was cleaned and preliminary analyses were conducted to test assumptions. A missing values analysis was conducted on the original data comprised of 445 with 25 cases excluded from the datset. The majority of deleted cases were comprised of participants with significant missing data. A subsequent missing values analysis was then performed revealing less than 5% of data was missing across all independent variables (IV) and dependent variables (DV), with all cases retained for a final data set of N = 420 (Tabachnick and Fidell, 2007). Box plots and histograms were used to assess the presence of outliers visually. Scaled variables were also examined for points above or below three standard deviations from the mean Histograms were also inspected for normality.

Intercorrelations Between Continuous Variables

To examine correlational hypotheses outlined in part a and b of the study, intercorrelations between research variables were examined to determine the significance and direction of relationships. According to Pallant (2020), independent and dependent variables should show a relationship r = < .3. However, correlations among independent variables should preferably not exceed .7 to reduce adverse effects of multicollinearity (Pallant, 2020). Table 20 presents the means, standard deviations, and correlations among research variables within the study.

Table 20

Means, Standard Deviations, and Correlations (n = 420)

Variable	*M*	*SD*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
1. Mindfulness	122.95	17.48									
2. Resilience	74.90	13.25	.62**								
3. Psychological inflexibility	22.20	8.63	-.62**	-.57**							
4. Perceived stress	28.37	6.50	-.64**	-.53**	.67**						
5. Positive emotions	32.63	8.26	.50**	.61**	-.45**	-.55**					
6. Negative emotions	22.24	21.41	-.17**	-.18**	.22**	.27**	-.09				
7. Psychological distress	34.68	10.18	-.51**	-.47**	.63**	.70**	-.40**	.30**			
8. Self-compassion	77.84	17.04	.65**	.55**	-.68**	-.69**	.42**	-.21**	-.60**		
9. Positive re-appraisal	13.44	4.17	.49**	.50**	-.37**	-.44**	.42**	-.14**	-.33**	.58**	
10. Satisfaction with academic experience	19.57	3.48	.18**	.35**	-.20**	-.17**	.17**	-.13**	-.24**	.17**	.24**

Note. M and *SD* are used to represent mean and standard deviation, respectively.
* Indicates $p < .05$. ** indicates $p < .01$.

Consistent with previous research and the current study, meaningful and significant intercorrelations were observed between all research variables in the appropriate direction (See Table 20). Mindfulness showed a significant positive correlation with self-compassion (r = .65, p < .01), positive emotions (r = .50, p < .01), positive re-appraisal (r = .49, p <. 01). As predicted, a significant negative correlation was observed between mindfulness and psychological inflexibility (r = -.62, p < .01), indicating that higher mindfulness is associated with higher *psychological flexibility.* Results showed that psychological inflexibility was significantly negatively correlated with positive emotions (r = -.45, p < .01), and self-compassion (r = -.68, p < .01). Specifically, as higher scores on this variable indicate higher psychological inflexibility, these results indicate that higher *psychological flexibility* was associated with significantly higher positive emotions and self-compassion. Results also showed that positive emotions were significantly positively correlated with self-compassion (r = 0.42, p<.01), and positive re-appraisal (r = .42, p < .01).

Resilience showed a significant positive correlation with mindfulness ($r = .62$ $p < .01$), self-compassion ($r = .55$, $p < .01$), positive emotions ($r = .61$, $p < .01$), and positive re-appraisal ($r = .5$, $p < .01$). Resilience showed a significant negative correlation with psychological inflexibility ($r = -.57$, $p < .01$), indicating that higher resilience was associated with significantly lower psychological inflexibility. Similarly, as predicted, SAE also showed a significant positive correlation with mindfulness ($r = .18$ $p < .01$), self-compassion ($r = .17$, $p < .01$), positive emotions ($r = .17$, $p < .01$), and positive re-appraisal ($r = .24$, $p < .01$). SAE showed a significant negative correlation with psychological inflexibility ($r = -.20$, $p < .01$), indicating that higher SAE was associated with significantly lower psychological inflexibility.

Perceived stress was significantly negatively correlated with mindfulness ($r = -.64$, $p < .01$), self-compassion ($r = -.69$, $p < .01$), positive emotions ($r = -.55$, $p < .01$), and positive re-appraisal ($r = -.55$, $p < .01$). Similarly, psychological distress also showed a significant negative correlation with mindfulness ($r = -.51$, $p < .01$), self-compassion ($r = -.21$, $p < .01$), positive emotions ($r = -.41$, $p < .01$), and positive re-appraisal ($r = -.33$, $p < .01$). A significant positive correlation was observed between psychological inflexibility and perceived stress ($r = .67$, $p < .01$), and psychological distress ($r = .63$, $p < .01$), indicating that higher *psychological flexibility* was associated with significantly lower perceived stress and psychological distress.

Structural equation modelling (SEM)

Structural Model 1

To examine the hypotheses pertaining to the evaluation of the MEI and direct causal and correlational relationships between variables, path analysis was conducted. Figure 6 below presents the path model containing significant regression coefficients for Structural Model 1. The direction of the arrows depicts the hypothesized direct paths, as well as representation of correlational relationships. Figure 6 below shows the regression and correlation results, as well as significance values. Results are discussed in detail below.

Figure 6

Structural Model 1

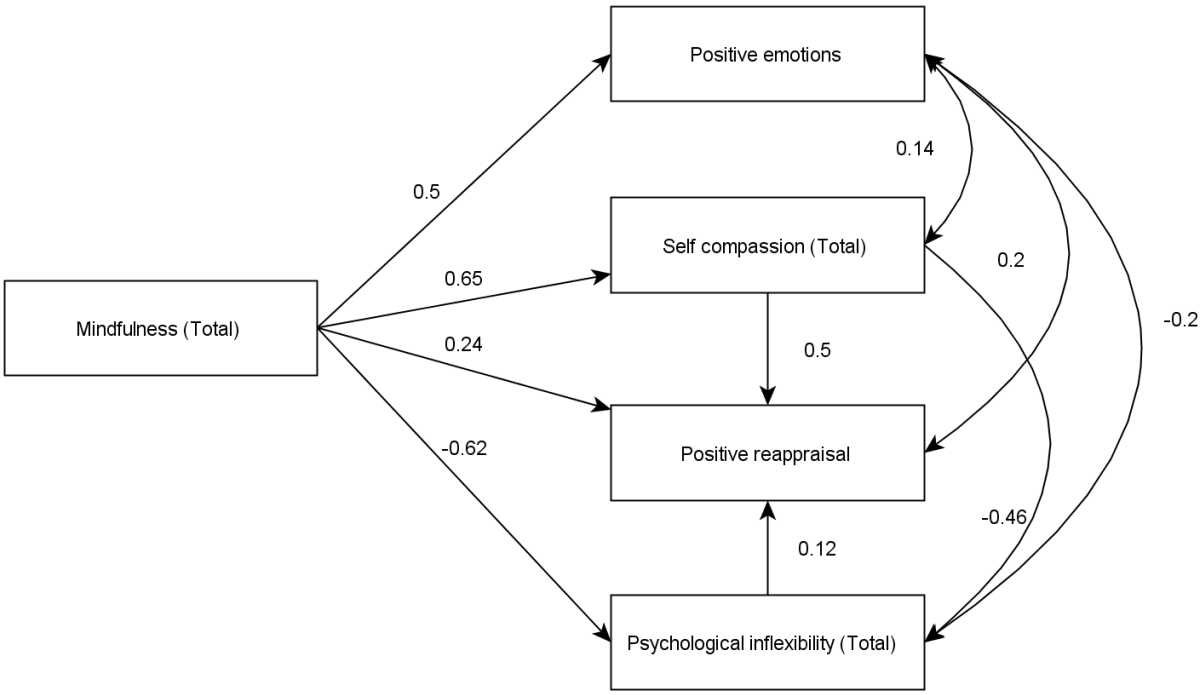


Table 21 and 22 below show the structural model fit for the data. Results showed the fitted model was not significantly worse compared to the null model ($\Delta\chi^2$ (1) = 0.001, p = 0.972), which indicates Structural Model 1 presents a good fit for the data.

Table 21

Chi Square Test Statistic (unscaled)

	df	*AIC*	*BIC*	χ^2	$\Delta\chi^2$	*p*
Saturated	0	.	.	0.000	.	.
Model 1	1	5097.3	5153.9	0.001	0.001	0.972

Table 22

Chi Square Test Statistic (unscaled)

User Model Versus Baseline Model	
Measure	Result
Comparative Fit Index (CFI)	1.000
Tucker-Lewis Index (TLI)	1.011
RMSEA	0.000
$P_{RMSEA} <= 0.05$	0.984
SRMR	0.0001
Goodness of Fit Index (GFI)	1
Parsimony Goodness of Fit Index (GFI)	1
McDonald Fit Index (MFI)	1.001
Expected Cross-Validation Index (ECVI)	0.067

Fit indices also showed structural model 1 was a good fit for the data. CFI was greater than .95 as well as TLI. The RMSEA was < .06 and P_{RMSEA} was greater than the .05, indicating good model fit. The SRMR was also lower than .08. The remaining indices also demonstrated a good model fit.

Path Analysis and Correlation Results: Model 1

To test the hypotheses outlined in Part A of the study pertaining to Model 1, path analysis and correlation analysis were performed. Table 23 presents the regression and correlation results for Structural Model 1.

Table 23

Regression and Correlation Results

			Estimate	SE	Z	p
Regression Results						
Psychological inflexibility	~	Mindfulness (Total)	-0.62	0.04	-16.21	< .001
Positive reappraisal	~	Mindfulness (Total)	0.24	0.05	4.43	< .001
Positive reappraisal	~	Self-compassion	0.50	0.06	8.74	< .001
Positive reappraisal	~	Psychological inflexibility	-0.12	0.06	2.13	0.033
Self-compassion	~	Mindfulness (Total)	0.65	0.04	17.60	< .001
Positive emotions	~	Mindfulness (Total)	0.50	0.04	11.98	< .001
Correlation Results						
Positive reappraisal	~~	Positive emotions	0.14	0.03	4.13	< .001
Psychological inflexibility	~~	Self-compassion	-0.27	0.03	-8.52	< .001
Self-compassion	~~	Positive emotions	0.09	0.03	2.92	0.004
Psychological inflexibility	~~	Positive emotions	-0.14	0.03	-4.06	< .001

Consistent with hypotheses outlined in the study, results showed that mindfulness was a significant predictor of psychological inflexibility (B = -.62, p < .001), indicating psychological inflexibility decreased by .62 standard deviations for each 1 standard deviation increase in mindfulness. Mindfulness was also a significant predictor of self-compassion (B = 0.65, p < .001), showing that self-compassion increased by .65 standard deviations for each 1 standard deviation increase in mindfulness. Similarly, mindfulness was also a significant predictor of positive emotions (B = 0.50, p < .001). This means that positive emotions increased by .50 standard deviations for each 1 standard deviation increase in mindfulness. Finally, mindfulness was a significant predictor of positive reappraisal (B = 0.24, p < .001), indicating positive reappraisal increased by .24 standard deviations for each 1 standard deviation increase in mindfulness. Self-compassion was also a significant positive predictor of positive reappraisal (B = 0.50, p < .001) which means that positive reappraisal increased by .50 standard deviation for each 1 standard deviation increase in self-compassion. Finally, psychological inflexibility was also a significant negative predictor of positive reappraisal (B = -.12, p = .033) which means that psychological inflexibility negatively influenced positive reappraisal.

Results pertaining to the evaluation of correlational relationships hypothesized in the MEI, showed positive emotions were significantly associated with self-compassion, positive reappraisal and psychological inflexibility. The correlation between positive emotions and positive re-appraisal was statistically significant ($r = .14$, $p < .001$), indicating that higher positive emotions were positively associated with higher positive re-appraisal. There was a positive correlation between positive emotions and self-compassion ($r = .09$, $p = .004$) which indicates that the variability in positive emotions was positively associated with the variability in self-compassion. Psychological inflexibility was negatively associated with self-compassion ($r = -.27$, $p < .001$) and positive emotions ($r = -.14$, $p < .001$), indicating that higher *psychological flexibility* was associated with higher self-compassion and positive emotions.

Effect size (R^2 and standardized estimates)

Finally, effect sizes were calculated. Overall, evaluation of the MEI via Model 1 showed that mindfulness explained 38.5% of the variance in psychological inflexibility. In line with the MEI, the main three variables (i.e., self-compassion, psychological inflexibility and mindfulness) explained 36.6% of the variance in positive reappraisal. Furthermore, mindfulness explained 42.5% and 25.5% of the variance in self-compassion and positive emotions respectively. Table 24 below shows the effect size for independent variables.

Table 24

Effect Size for Independent Variables

Dependent variable	R^2
Psychological inflexibility	0.385
Positive reappraisal	0.366
Self-compassion	0.425
Positive emotions	0.255

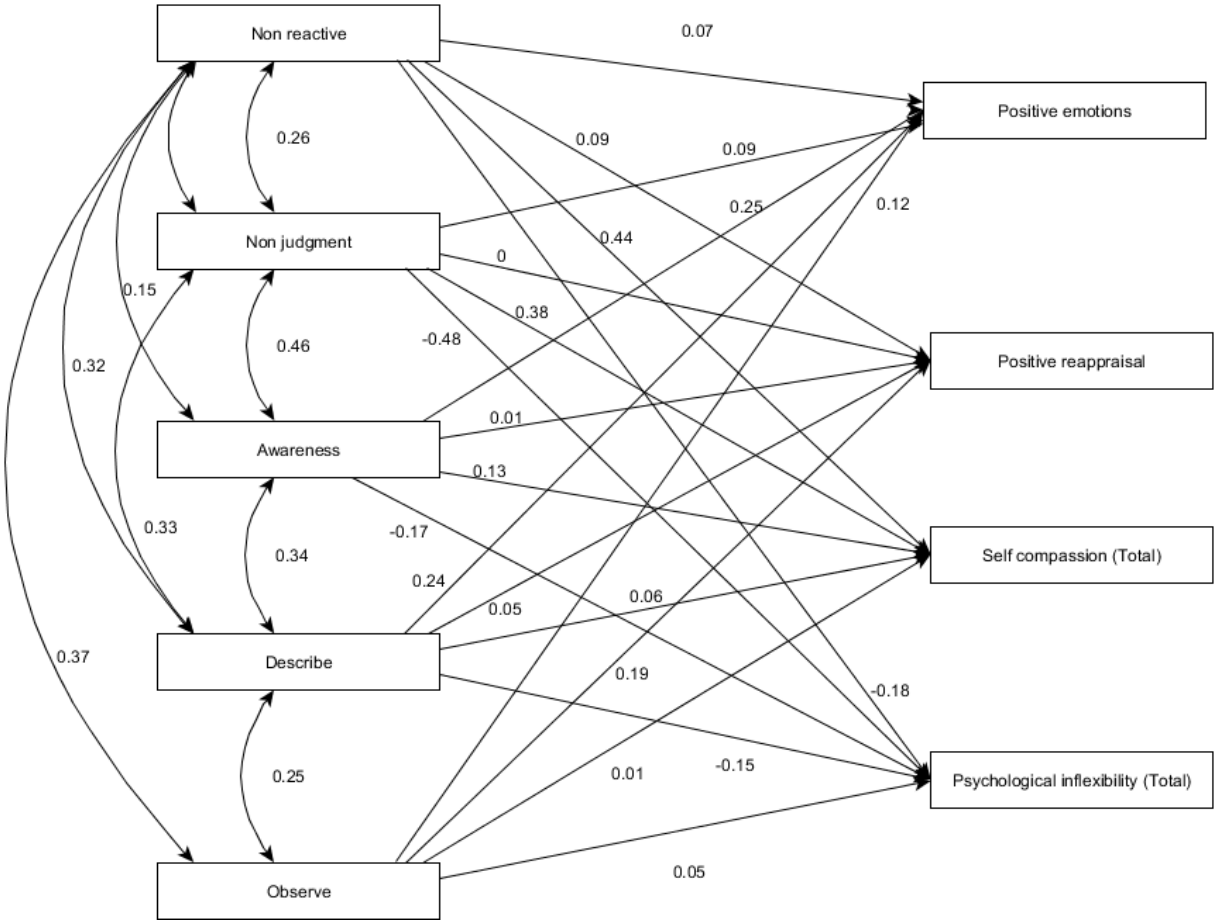
Structural Model 2

To examine and explore the hypotheses pertaining to Part B in the study, a second path model was evaluated which examined the FFMQ subscales separately. This model aimed to extend model 1 and provide more specific and detailed information regarding the direct, causal and correlational relationships between the five subscales and variables within the MEI. Specifically, direct and correlational relationships were examined between the FFMQ subscales; 1) Observing, 2) Describing, 3) Acting with Awareness, 4) Non-judging of Inner

Experience and 5) Non-reactivity to Inner Experience and psychological inflexibility, positive emotions, self-compassion and positive re-appraisal. This model was essential in determining if different components of mindfulness are needed to predict variables within the MEI. Figure 7 below presents the path model containing significant regression coefficients for Structural Model 2. The direction of the arrows depicts the hypothesized direct paths, as well as representation of correlational relationships. Table 25 below shows the regression and correlation results, as well as significance values. Results are discussed in detail below.

Figure 7

Structural Model 2



Structural Model Fit

Results showed the fitted model was not significantly worse compared to the null model, indicating that model 2 is a good for the data.

Table 25

Chi Square Test Statistic (unscaled)

	df	*AIC*	*BIC*	χ^2	$\Delta\chi^2$	*p*
Saturated	0	.	.	0.000	.	.
Model 1	7	9400.9	9554.4	5.250	5.250	0.630

Results in Table 26 below show the Fit indices which demonstrated model 2 was a good fit for the data. CFI was greater than .95 as well as TLI. The RMSEA was < .06 and P_{RMSEA} was greater than the .05 which indicates good model fit. The SRMR was also lower than 0.08. The remaining indices, such as GFI demonstrated a good model fit.

Table 26

Chi Square Test Statistic (unscaled)

User model versus baseline model

	Model
Comparative Fit Index (CFI)	1.000
Tucker-Lewis Index (TLI)	1.007
RMSEA	0
P_{RMSEA}	0.95
SRMR	0.015
GFI	0.997
McDonald Fit Index (MFI)	1.002
Expected Cross-Validation Index (ECVI)	0.193

Path Analysis and Correlation Results: Model 2

To test the hypotheses outlined in Part B of the study, path analysis and correlation analysis were performed. Table 27 presents the regression and correlation results for structural model 2.

Table 27

Regression and Correlation Results

			Estimate	SE	Z	P
Regressions						
Psychological inflexibility	~	Observe	0.05	0.04	1.24	0.216
Psychological inflexibility	~	Describe	-0.15	0.04	-3.73	< .001
Psychological inflexibility	~	Awareness	-0.17	0.04	-4.17	< .001
Psychological inflexibility	~	Non-Judgement	-0.48	0.04	-11.85	< .001
Psychological inflexibility	~	Non-Reactive	-0.18	0.04	-4.53	< .001
Self-compassion	~	Non-Reactive	0.44	0.04	11.62	< .001
Self-compassion	~	Non-Judgement	0.38	0.04	9.80	< .001
Self-compassion	~	Describe	0.06	0.04	1.46	0.145
Self-compassion	~	Awareness	0.13	0.04	3.45	< .001
Self-compassion	~	Observe	0.01	0.04	0.21	0.835
Positive reappraisal	~	Self-compassion	0.48	0.06	8.55	< .001
Positive reappraisal	~	Awareness	0.01	0.05	0.19	0.848
Positive reappraisal	~	Observe	0.19	0.04	4.57	< .001
Positive reappraisal	~	Describe	0.05	0.04	1.20	0.272
Positive reappraisal	~	Non-Judgement	-0.01	0.05	-0.10	0.923
Positive reappraisal	~	Non-Reactive	0.09	0.05	1.79	0.074
Positive emotions	~	Observe	0.12	0.05	2.69	0.007
Positive emotions	~	Describe	0.24	0.05	5.08	< .001
Positive emotions	~	Non-Judgement	0.09	0.05	1.83	0.068
Positive emotions	~	Non-Reactive	0.07	0.05	1.54	0.123
Positive emotions	~	Awareness	0.25	0.05	5.10	< .001
Correlations						
Psychological inflexibility	~~	Self-compassion	-0.19	0.03	-7.69	< .001
Self-compassion	~~	Positive emotions	0.12	0.03	4.24	< .001
Positive reappraisal	~~	Positive emotions	0.13	0.03	3.98	< .001
Psychological inflexibility	~~	Positive reappraisal	0.01	0.02	0.48	0.631
Psychological inflexibility	~~	Positive emotions	-0.15	0.03	-4.97	< .001

Results showed that all FFMQ subscales were significant negative predictors of psychological inflexibility, except the Observe subscale (B = .05, p = .216). This indicates that higher levels of the subscales of Describing, Acting with Awareness, Non-judging of Inner Experience and Non-reactivity to Inner Experience were associated with lower

psychological inflexibility. Non-judging of Inner Experience was the strongest predictor of psychological inflexibility (B = -.48, p < .001), indicating this element of mindfulness is most salient in predicting psychological flexibility in an EA university student population.

Results showed that all FFMQ subscales were significant positive predictors of self-compassion except the Describing subscale (B = .06, p = .145) and the Observe subscale (B = .01, p = .835). This indicates that higher levels of the Acting with Awareness Subscale, Non-judging of Inner Experience Subscale Non-reactivity to Inner Experience Subscale were associated with higher self-compassion. The Non-reactivity to Inner Experience Subscale was the most significant predictor of self-compassion (B = .44, p < .001), indicating these elements of mindfulness are most salient in predicting self-compassion in an EA university student population.

Results showed that three of the subscales of the FFMQ were significant predictors of positive emotions. These included the Observe Subscale (B = .12, p = .007), the Describe Subscale (B = .24, p <.001) and the Acting with Awareness Subscale (B = .25, p <.001). Finally, results showed that only one subscale of the FFMQ, the Observe Subscale was a significant predictor of positive re-appraisal (B = .19, p < 0.001). This indicates that Observing was the most salient aspect of mindfulness in predicting higher positive re-appraisal in an EA university population. Self-compassion was a stronger predictor of positive reappraisal compared to any of the FFMQ subscales (B = .48, p < .001), indicating that self-compassion was an essential component of the MEI and predictor of EA Australian university student positive re-appraisal capacity.

Results pertaining to correlational relationships showed that the relationship between psychological inflexibility and self-compassion was statistically significant (r = -.19, p < .001), indicating that higher psychological inflexibility was associated with lower self-compassion. Similarly, the relationship between psychological inflexibility and positive emotions was also statistically significant (r = -.15, p < .001), indicating that higher psychological inflexibility was associated with lower positive emotions. The relationships between positive emotions and self-compassion (r = .12, p < .001) and positive re-appraisal (r = .13, p < .001) were also statistically significant, indicating that higher positive emotions were associated with higher self-compassion and positive re-appraisal.

Effect Size (R^2 and Standardized Estimates)

Finally, effect sizes were calculated. Overall, evaluation of the variance of dependent variables explained in model 2 is higher compared to variance explained in model 1, with

51% of the variance in the dependent variable positive re-appraisal explained through model 2 compared to 39% in model 1. Similarly, 54% of the variance in self-compassion was explained by the independent variables in model 2 compared to 43% in model 1. Table 28 below shows the effect sizes for independent variables.

Table 28

Effect Size for Independent Variables

Dependent variable	*R2*	
	Model 1	*Model 2*
Psychological inflexibility	0.39	0.51
Positive reappraisal	0.37	0.40
Self-compassion	0.43	0.54
Positive emotions	0.26	0.27

Discussion

The purpose of the current study was to extend the literature and empirical research pertaining to mindfulness, self-compassion, positive re-appraisal and the understanding of a resilient stress-response within the EA. Specifically, this was achieved by evaluating the validity of the newly proposed MEI with an EA university population studying in Australia. Despite consensus among researchers, psychologists, government bodies and university institutions regarding the vulnerability of young people attending university to stress and mental health concerns, limited research has directly examined how to support this population successfully and more specifically, how to promote positive re-appraisal and eudaimonic resilience throughout this essential developmental period. Furthermore, a paucity of validated models exists which provide empirical evidence for mechanisms and processes underpinning a resilient stress-response in EA university students.

The current research aimed to address these gaps in the literature by providing a newly developed, theoretically sound and validated mindfulness-based model. This research is essential, as the MEI also provides a framework and foundation to guide and inform the appropriate development of MBIs designed to target identified protective mechanisms for resilience within an EA population in Australia.

The MEI was developed following review of contemporary theories and factors associated with resilience, growth and adaptation in the EA and provides a novel and expanded perspective. The MEI is a longitudinal process model of mindful emotion regulation, and quality and integration of relational systems (with self, others and world), promoting response flexibility, self-awareness and regulation, positive emotions and compassion (towards self, others and the world) as a foundation for beneficial meaning making of life events and challenges. This in turn, fosters eudaimonic resilience, growth and personal potential across the lifespan. Depending on the application of the model to a specific population, the unique developmental tasks and impending/current life-cycle transition are also considered to provide guidance around the nature and context of specific stressors to inform the development of appropriate intervention. Chapter 4 outlined the unique developmental tasks, transitions and stressors common to EA attending university, and considers systemic theories outlining the important task of moving towards self-differentiation.

Chapter 4 also proposed the new and potentially more appropriate concept of EI as a more comprehensive definition of resilience and adaptation within the EA, with potential

application across the lifespan. This theory proposed that fostering adaptive self-regulation, meaning making and wisdom during and following adversity involves integrated neurobiology and balanced, adaptive components of mind and body considered within the context of relational systems (Seigel, 2012; Brown, 2012). That is, where the individual is moving towards a differentiated sense of self within social spheres (Skowron et al., 2009; Bowen, 1978). Through moving towards integrated neurobiology, the individual can navigate these stressors and relationships with increasing psychological flexibility and self-differentiation, remaining healthily connected and confidently autonomous during times of adversity.

This new concept further extends systemic theories by proposing the quality and balance within relationships with others is not the only relationship salient to a resilient stress response. Moving towards an accepting and compassionate self-relationship, is proposed as a critical foundation during EA in moving towards balance and stability of mind and body and self-differentiation. This research contends that self-compassion is an essential component of maintaining self- regulation (i.e., staying within the Window of Tolerance and mind-body homeostasis), psychological flexibility and beneficial meaning making throughout life to flourish and reach individual potential.

It is proposed that EI fluctuates over time and is an ongoing process of cultivation, requiring effort and commitment to create and sustain, much like a muscle within the body. However, with committed action, it is proposed that EI may move from trait to dispositional mechanisms for relating to the world. The new theory of EI contends that the whole premise of resilience and well-being is founded on the *quality, flexibility and health* of relationship with self, others and the world across the lifespan; and our capacity to bring awareness to and make beneficial meaning of events within these relationships. This in turn facilitates growth and integration in the face of commonly shared challenges associated with being a human being.

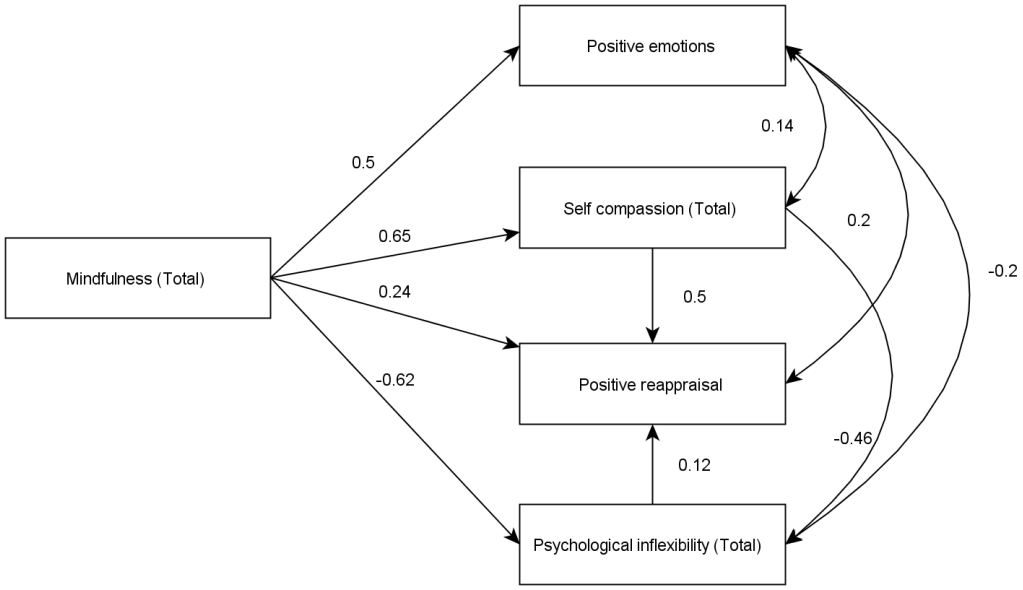
The MEI consolidates and expands contemporary theories and provides a solid guiding foundation for successfully supporting this population. Whilst Study 1 highlighted the essential role that resilience plays in reducing stress, psychological distress and preventing university student attrition among EA students from different developed regions, Study 2 has expanded this research by identifying important mechanisms underpinning resilience . The results of Study 2 provide preliminary support for the MEI as a validated model of resilience and show the process of how these mechanisms come about. With appropriate, evidence-

based interventions based on guiding models and frameworks, EAs can cultivate essential protective resources which provide an adaptive and integrated psychological foundation in the transition to adulthood and beyond.

The current study was divided into three sections, with hypotheses pertaining to Part A directly relating to the expansion of Study 1. Specifically, the relationships between the underlying mechanisms within the MEI, and additional outcome variables of resilience, satisfaction with academic experience, perceived stress and psychological distress were examined. Part A also provided support for the subsequent analyses designed to evaluate the MEI. Part B of the study evaluated the MEI by examining the predicted direct causal and correlational relationships among variables in the model and aimed to establish the important role of mindfulness as a predictor of underlying mechanisms within the MEI. Finally, Part C of the study further evaluated the MEI to provide specific information regarding the ways in which individual mindfulness components cultivates specific mechanisms within the MEI. This element of the study was considered essential in providing specific information designed to guide the development of MBIs with EA university students. To assist in understanding the hypotheses and result, Figure 8 presents Structural Model 1 again below.

Figure 8

Structural Model 1



Part A Hypotheses 1 and 2, which predicted that resilience and SAE would be significantly positively correlated with mindfulness, self-compassion, positive emotions and

positive re-appraisal, and significantly negatively correlated with psychological inflexibility was supported. This means that higher levels of resilience and SAE were associated with variables outlined within the MEI. To clarify, higher resilience and SAE were associated with lower psychological *inflexibility,* meaning that higher resilience and SAE are associated with greater capacity for psychological flexibility – a protective mechanism proposed in the MEI. Hypotheses 3 and 4, which predicted that perceived stress and psychological distress would be significantly negatively associated with mindfulness, self-compassion, positive emotions and positive re-appraisal, and significantly positively correlated with psychological inflexibility, were supported. These results suggest that lower perceived stress and psychological distress were associated with the protective mechanisms proposed within the MEI. These results indicate that higher perceived stress and psychological distress was associated with higher psychological *inflexibility,* meaning that higher psychological flexibility was associated with lower perceived stress and psychological distress as outlined in the model. These results are partially consistent with aspects of previous research (e.g., Wersebe et al., 2018), however to the author's knowledge these results have not been examined within an EA university population and provide support for the evaluation of the MEI as a model of EA Australian university student eudaimonic resilience and integration.

Part B Hypothesis 1, which predicted that mindfulness would be a significant positive predictor of self-compassion, positive emotions and positive re-appraisal, where higher mindfulness would predict higher self-compassion, positive emotions and positive re-appraisal, and would be a significant negative predictor of psychological inflexibility, was supported. These results provide evidence for higher levels of mindfulness as a predictor of all mechanisms proposed within the MEI. Again, higher mindfulness was a predictor of lower psychological *inflexibility,* meaning that higher mindfulness predicted greater capacity for psychological inflexibility. To the author's knowledge, the examination of the relationship between these variables within a newly developed model with application to an EA population is novel to this study.

Hypothesis 2 which predicted that self-compassion would be a significant positive predictor of positive re-appraisal, where higher self-compassion predicted higher positive re-appraisal was supported. These results provide support for the essential role of self-compassion in the MEI, and highlight that the capacity for cultivating a mindful, compassionate relationship with the self and connectedness to a sense of common humanity is

a predictor of EA university students' capacity to positively re-appraise stressful experiences as either benign or beneficial.

Hypothesis 3 which predicted that psychological *inflexibility* would be a significant negative predictor of positive re-appraisal, where higher psychological inflexibility was a predictor of lower positive re-appraisal was supported. This result suggests that the capacity for higher psychological flexibility predicts EA's greater capacity to appraise stressful events as benign or beneficial. To the author's knowledge, limited research has examined the role of self-compassion and psychological flexibility as predictors of this important resiliency and life skill in the face of adversity.

Finally, Hypothesis 4 which predicted that positive emotions would be significantly positively correlated with self-compassion and positive re-appraisal, and significantly negatively correlated with psychological inflexibility was supported. These results suggest that higher experience of positive emotions was associated with higher self-compassion and positive re-appraisal. In contrast, higher positive emotions were associated with lower psychological *inflexibility,* meaning that the more positive emotions individuals experience, the more psychologically flexible they also tend to be.

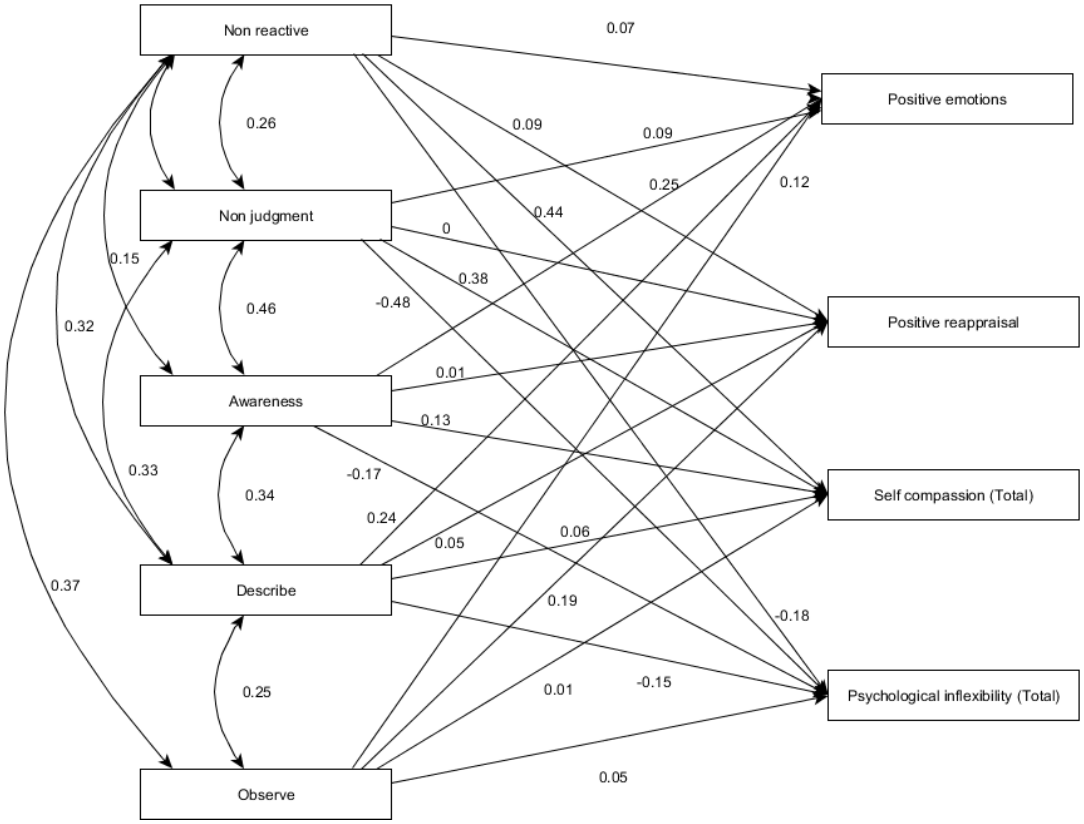
Overall, these results provide compelling evidence for the MEI as a resiliency framework within this population. Specifically, the essential predictive role of mindfulness in cultivating all important adaptive mechanisms within the model, including psychological flexibility, self-compassion, positive emotions and positive re-appraisal has been clearly identified. Furthermore, as suggested by the MEI, greater capacity for psychological flexibility and self-compassion are also predictors of positive re-appraisal capacity within the EA. These results provide solid, and validated support for the role of mindfulness, psychological flexibility and self-compassion in cultivating positive re-appraisal in response to adversity within the EA university student. Moreover, these results also highlight the important association of positive emotions within the model.

Given the essential role of mindfulness identified within the evaluation of the MEI, Part C was designed to examine the five subscales of the FFMQ separately to determine the strength and direction of each subscale as predictors of psychological flexibility, self-compassion, positive emotions and positive re-appraisal. Hypothesis 1 which predicted that the five FFMQ subscales; 1) Observing, 2) Describing, 3) Acting with Awareness, 4) Non-judging of Inner Experience and 5) Non-reactivity to Inner experience would be significant positive predictors of self-compassion, positive emotions and positive re-appraisal was

partially supported. Similarly, Hypothesis 2 which predicted that the five FFMQ subscales; 1) Observing, 2) Describing, 3) Acting with Awareness, 4) Non-judging of Inner Experience and 5) Non-reactivity to Inner experience would be a significant negative predictor of psychological flexibility was partially supported. To clarify, this was examining the capacity of each subscale as a predictor of higher psychological *flexibility.* To assist in understanding the hypotheses and results, Figure 9 presents Structural Model 2 again below.

Figure 9

Structural Model 2



Specifically, all subscales except the Observing Subscale were significant predictors of psychological flexibility. Non-judging of Inner Experience was identified as the strongest predictor of psychological flexibility. Similarly, all subscales except the Describing Subscale were significant predictors of self-compassion, with the Non-reactivity to Inner Experience identified as the most significant predictor of self-compassion. With regards to predicting positive emotions, the Observe, Describe and Acting with Awareness Subscales were significant predictors of positive emotions, with Acting with Awareness identified as the strongest predictor of positive emotions. Finally, the Observe Subscale was the only

significant predictor of positive re-appraisal, with self-compassion identified as a stronger predictor in comparison to each of the FFMQ subscale.

These results are important as they highlight that, whilst mindfulness is overall a significant predictor of each identified mechanism within the MEI, further investigation of each separate subscale would assist to determine what specific elements are most salient in cultivating each element. These results show the importance of various aspects of mindfulness in cultivating psychological flexibility but highlights the importance of cultivating Non-judgement of Inner Experience as the strongest predictor in EA university students studying in Australia. Specifically, as nonjudging of inner experience involves accepting and not evaluating thoughts and emotions (e.g., as "good" or "bad"), this suggests that psychological flexibility is consistent with the mindfulness skill of moving away from experiential avoidance, such as those outlined in third wave cognitive therapies such as Acceptance and Commitment Therapy (Hayes et al., 1999) .

Similarly, whilst various subscales were important predictors of self-compassion, Non-reactivity to Inner Experience was the most significant predictor in EA university students. This suggests that the ability to detach from thoughts and emotions, allowing them to come and go without getting involved or carried away by them is the most important mindfulness skill for cultivating self-compassion. This is also consistent with the mindfulness skill of decentering (or creating psychological space from thoughts or emotions) which is described as defusion in Acceptance and Commitment Therapy (Hayes et al., 2006). With regards to positive emotions, Acting with Awareness was identified as the strongest predictor. This suggests that attending to one's present moment activity, rather than being on "autopilot," or behaving automatically, while attention is focused elsewhere, is the most important predictor of cultivating positive emotions in EA university students.

Finally, only the Observe Subscale was a significant predictor of positive re-appraisal suggesting that attending or simply being with and noticing internal and external experiences (e.g., sounds, emotions, thoughts, bodily sensations, smells) is associated with higher capacity to appraise these events as being neutral or of benefit to growth. One explanation could be that the Observe items have different meanings for meditators and non-meditators (Grossman and Van Dam 2011). Baer et al. (2008) suggests that the Observe subscale may be sensitive to changes with meditation practice, such that its relationship with other facets of mindfulness becomes stronger as meditation experience increases. Observing one's experience could therefore be a key facet of the mindfulness construct, but only once a certain level of

meditation practice has been established (Baer et al., 2008). Overall, the results showed that self-compassion was a stronger predictor of positive re-appraisal compared to any of the FFMQ subscales, suggesting that self-compassion is an essential and unique component and predictor of EA university student's capacity to re-appraise stressful events as benign or positive. These results appear to provide support for the MEI, by highlighting support for the method or process via which positive re-appraisal is facilitated in this population. Whilst mindfulness appears essential in cultivating psychological flexibility and self-compassion, the cultivation of self-compassion appears to be a critical element of facilitating positive re-appraisal capacity.

These results are unique and extend previous research into positive re-appraisal and provide evidence for the multifaceted nature of promoting adaptive relationships and resources during stressful periods or events. These results also provide strong support for the MEI as a guiding framework for enhancing EA university student psychological well-being and satisfaction with academic experience.

Limitations and Future Research

Several limitations are noted with the current study. Firstly, self-report methods and social desirability biases present as limitations and future research should incorporate the collection of collateral data and consider the inclusion of a social desirability scale to avoid potential confounding of results. Secondly, the current study should be replicated using a larger sample of EA university students studying in Australia to increase the generalisability of the results. More specifically, examining populations from urban compared with rural environments, as well as exploring differences and application of the MEI with domestic and international students would assist to provide a deeper understanding of the applicability and generalisability of the MEI with EA university students studying in Australia.

Additionally, the study sample was predominately female. Whilst this is representative of the general university student population within Australia, future research could examine the MEI with more balanced, or specifically with male samples to better understand the applicability of the MEI to EA students overall. Data was collected using via convenience sampling from one Australian university, Bond University. Future research could expand this to collect data from multiple universities to increase the generalisability of the results. Future research could also develop structural models to assess specific subscales of the FFMQ with other outcome variables, such as hope, optimism, flourishing or unity.

More generally, future research could examine the validity and applicability of the MEI with other populations. This would provide clarity regarding the specific components relevant to targeting EI within other developmental stages. Furthermore, the MEI could be more specifically assessed with populations transitioning through various life cycle stages. For example, focusing on populations that are newly married, transitioning to becoming parents, the family with adolescents about to launch, or in older generations. Data could be collected from multiple sources within these systems (i.e., schools, family members, etc).

Conclusion

Currently limited consensus exists regarding the process of "how" to cultivate a comprehensive and adaptive set of resources and template for resilience and adulthood for the EA engaged in university studies within Australia. The results of this study and consolidation and expansion of theory outlined in Chapter 4 attempt to address these gaps and offer a conceptual and evidence-based framework to guide the development of MBIs designed to support young people's transition to university. Whilst this research provides an important contribution to research pertaining to EA university students, fundamental research gaps and questions remain. Specifically, whether the MEI can function as a guiding framework for the development of a successful MBI with this population. Such an MBI would need to be guided by the MEI and consider the unique mindfulness components identified to promote each resource within the model. Currently there are limited evidence based and effective MBI's designed specifically to target EA student's successful transition through university studies in Australia and into adulthood. Both the MEI and associated development of an appropriate MBI, would provide a critical foundation which could be expanded and adapted beyond the EA, to provide greater understanding and support of how to promote EI across the lifespan.

Study 3 below will conduct an RCT to examine the efficacy of a pilot MBI, the MARST-P. The six-session version of the MARST-P was developed following the results of Study2. MARST-P was evaluated with an EA medical student population studying in Australia, to evaluate the efficacy of both the MEI and the program at fostering psychological well-being and resilience and reducing perceived stress and psychological distress in specific populations.

CHAPTER FIVE
THE MODEL OF EUDAIMONIC INTEGRATION AS A FRAMEWORK FOR MINDFULNESS-BASED INTERVENTIONS

Chapter Overview

Chapters 1 and 2 identified the increasing concerns regarding the mental health and well-being of EA university students (e.g., Dawson et al., 2020; Regehr et al., 2012). As previously discussed, EAs are considered at higher risk for the development of psychological disorders, due to the developmental and transitional stressors associated with their transition through the first life cycle (i.e., launching from home) and adjusting to university (Brown, 2012; Dvorakova et al., 2018; Lo et al., 2018). There is increasing evidence of students requesting support from university counselling services each year (Dvorakova et al., 2018; Roeser, 2012). Recently, there has been a clear call from government bodies and institutions for a more comprehensive understanding of how to provide effective developmental and preventative approaches to mental health needs of young university students (e.g., The National Centre of Excellence in Youth Mental Health; 2017).

EA medical students are a higher-risk population compared to young people in other degrees for the development of chronic, severe stress and psychological distress (Dobkin & Hutchinson, 2013; Page, 2019). Young medical students report higher depression and suicidal ideation, anxiety, substance abuse and other pathological coping styles, compromised interpersonal relationships and support systems, ethical erosion, de-idealisation, and destabilised concepts of self and world (Dobkin & Hutchinson, 2013). EA medical students encounter additional stressful and challenging experiences during this developmental stage, including with longer work hours, ongoing significant study requirements, and need for the rapid development of clinical skills in ongoing stressful and challenging environments (Witt et al., 2019).

Chronic stress places medical students at risk of ongoing psychological distress and psychopathology well into their adult careers (Rotenstein et al., 2016). There is a clear and evident need for researchers and practitioners to provide evidence-based frameworks to guide effective interventions with both the general and at-risk sub-groups. Current support strategies and services are not sufficient to support the needs of young people, especially high-risk groups such as medical students, during this vulnerable and transitional time.

Chapter 4 and Study 2 provided compelling evidence for the validity of the MEI as a framework for cultivating resilience, positive re-appraisal psychological well-being and

overall EI in this population. Specifically, the results of Study 2 demonstrated the essential predictive role of mindfulness in cultivating all important adaptive mechanisms within the model, including psychological flexibility, self-compassion, positive emotions and positive re-appraisal and clearly identified the crucial role of targeting self-compassion within this population to enhance these outcomes.

Within Australian universities there has been a clear call to provide evidence-based support and interventions for young people, especially at-risk groups (The National Centre of Excellence in Youth Mental Health; 2017). Evidence supporting the use of MBIs to promote health outcomes among university students is still unfolding (Dawson et al., 2019), with consistent significant reductions in psychological distress reported in students following both standard MBI's (i.e., generally 8-weeks) and brief MBI's (i.e., briefer intervention periods; Dawson et al; Williams et al., 2015). For at-risk populations such as medical students, MBI's have demonstrated efficacy in reducing perceived stress, anxiety, depressive symptoms and as well as increasing mindfulness, empathy and self-compassion (Dobkin & Hutchinson, 2013). Limited Australian based universities offer MBIs to EA university students.

This chapter aims to review the literature pertaining to the development of MBI's with EA university students in the general population, as well as those in programs such as medicine which present greater risk for stress and psychological distress. Furthermore, this chapter briefly reviewed the MEI and proposes ways the model can act as a guiding framework for the development of MBI's specific to this population. Finally, this chapter proposes a new pilot MBI program with EA university students studying in Australia, the six-session MARST-P, and explores how this program may effectively target factors within the MEI specific to EA an Australian based medical student sample from Bond University.

The Development of Mindfulness-based Interventions

Whilst only recently integrated into western psychology and medicine, the benefits of mindfulness-based practice have been an established aspect of Buddhist philosophy for over 2,500 years (Armstrong, 2001; Baer, 2003). To integrate these ancient skills into the modern world, psychologists and researchers begun developing MBI's, demonstrating successful treatment and outcomes with a range of clinical and non-clinical populations (McConville et al., 2017).

MBIs were first introduced to therapeutic settings by Kabat-Zinn (1982, 1990), who developed Mindfulness Based Stress Reduction (MBSR) and by Linehan (1993) who developed Dialectical Behaviour Therapy (DBT), a therapy commonly used as an intervention

for borderline personality disorder. Mindfulness skills are also utilised in Mindfulness Based Cognitive Therapy (MBCT; Segal et al., 2002) and Acceptance and Commitment Therapy (ACT; Hayes et al., 1999). The effectiveness of mindfulness-based approaches to treatment has been well established (Shapiro et al., 2006). More recently, guides such as Trauma-Sensitive Mindfulness (Treleaven, 2018) have emerged guiding the use of this ancient practice for healing trauma. Mindfulness skills have also been integrated alongside somatic and energetic approaches such as The Polyvagal Theory in Therapy (Dana, 2018) as well as Emotion Freedom Technique (Craig & Fowlie, 1995) to enhance outcomes.

As previously outlined in Chapter 4, one of the most widely cited operational definitions of mindfulness is "the awareness that emerges through paying attention on purpose, in the present moment, and non-judgementally to the unfolding of experience moment by moment" (Kabat-Zinn, 2003, p. 145). Mindfulness based training is a trans-diagnostic intervention, eliciting positive effects on a variety of mental and physical health outcomes across populations (Dawson et al., 2020). In both clinical and non-clinical population MBI's have been demonstrated to decrease stress (Carmody et al., 2008) as well as anxiety and depression (Carmody et al., 2009), while also increasing levels of resilience, self-compassion (Brion et al., 2014), psychological flexibility, positive emotions and positive re-appraisal (Farb et al., 2013; Fredrickson et al., 2008; Garland et al., 2015).

Efficacy for MBI's in enhancing psychological and physiological well-being have been observed in veterans (Goldberg et al., 2020), cancer patients (Zimmermann et al., 2018), weight loss outcomes (Meyer, 2018), mental health and well-being of children and adolescents (Dunning et al., 2019) and workplace burnout and stress (Vella & McIver, 2019). Systematic reviews for the use of MBI's has also reported efficacy for use with university students, highlighting emerging and conflicting results (e.g., Dawson et al., 2020). These will be discussed below.

Current frameworks generally suggest that mindfulness training operates by producing changes in the structure of brain regions involved in attentional control, emotional regulation, sensory awareness, and self-awareness (Stapleton et al., 2020; Tang et al., 2015). Mindfulness training has been shown as distinguishable from relaxation training which acts on the hubs of intentional inhibition and control (Sevinc et al., 2018).

While the effectiveness of MBIs has been demonstrated, the mechanisms by which they result in benefits for participants require further investigation (Garland et al., 2015). Using factor analytic methods, Baer et al (2006) have empirically analysed the facets of

mindfulness. These facets include the observing facet (attending to a variety of internal or external phenomena), the describing facet (applying labels to observed phenomena), the acting with awareness facet (engaging fully in one's present activity), the nonjudging of inner experience facet (taking a nonevaluative stance towards thoughts and feelings), and the nonreactivity to inner experience facet (accepting thoughts and feelings and allowing them to come and go without getting carried away by them). The authors suggest that these facets, to varying degrees, contribute to the effectiveness of MBIs (Baer et al., 2008).

Mindfulness-Based Interventions with Emerging Adult University Students

Evidence that supports the use of MBI's to promote health outcomes among university students is still unfolding. A variety of modes and durations, both standard and brief, have been implemented with students, with mixed evidence on outcomes and effectiveness. A systematic review and meta-analysis conducted by Dawson et al. (2019) on MBI's with university students on a range of health-related outcomes showed evidence for effectiveness in this population. When comparing course based MBI's with passive controls, MBI's significantly reduced levels of psychological distress, depression, anxiety and rumination, and increased well-being in student's post-intervention. Limited studies utilised follow-up testing, so the duration of such effects requires further investigation.

An understanding of the effects of MBI's on physiological markers is still emerging. Dawson et al., (2019) reported that included studies measuring physiological markers such as cortisol did not find significant differences post intervention,, however power was limited due to sample size within these studies. The authors suggest that the inclusion of non-clinical participants may reduce the likelihood of detecting physiological improvements and the modification of biological parameters may require more time and practice.

With regards to intervention duration and format, Dawson et al., (2019) reported no significant difference between outcome benefits for MBI's with university students for instructor-led group-based MBI's compared with self-help MBI's. Furthermore, meta-regression results concluded that intervention duration was not a significant factor in predicting effects on psychological distress and mindfulness in students (Dawson et al., 2019). These results are supported by Demarzo et al., (2017) in a quasi-experimental study which reported no significant differences between a four-session and eight-session MBI for students.

Generally, evidence for MBI outcomes with this population is inconsistent and mostly from non-randomised evaluations. Previous randomised controlled trials for university

students have been generally underpowered, and had no prospective protocol, no primary outcome, multiple testing problems, researcher allegiance bias, inadequate analysis or treatment of missing data, lack of follow-up, or other methodological and reporting issues (Demarzo et al., 2017). The largest and best quality pre-existing trial randomly assigned 616 university students to an 8-week MBI, or a university based mental health support group (Galante et al., 2018). The findings showed moderate post-intervention effects on psychological distress and wellbeing only. Significant reductions in psychological distress were reported for those in the MBI, compared to the support group with the researchers concluding that the provision of mindfulness training could be an effective component of a wider student mental health strategy (Galante et al., 2018). Generally, these studies often focus on the inclusion of university students aged 18 years or older, with a paucity of studies focusing specifically on understanding the impact of MBI's on the EA university student (i.e., 18 to 29 years old).

Mindfulness Based Interventions with Emerging Adult Medical Students

Research conducted by Dobkin and Hutchinson (2013) identified that 14 universities around the world include mindfulness programmes within the curriculum or offer courses that teach mindfulness within their medical and dental programs. Most of these programs were run in the United States of America and Canada, except for one program offered in Australia (Monash University). Published journal articles were accessible for only two programs – Monash University, Australia and Dalhousie University, Canada. Whilst several studies are encouraging as they are testing pilot MBI programs with a variety of university populations, increasing rates of stress and psychological distress in young university students suggests the need for greater validated frameworks, interventions, and integration of these preventative measures into university contexts.

Generally, research suggests that MBI's are beneficial in reducing negative emotions and stress, as well as enhancing mindfulness, empathy and compassion in medical students (Dobkin & Hutchinson). McConville et al., (2017) conducted a systemic review of randomised and non-randomised control trials of the efficacy of MBI's for health profession students on psychological well-being, learning and clinical performance. Undergraduate or post-graduate students studying in a health profession course, including medicine (10 studies), psychology (one study), medicine and psychology (one study), social work (one study), nursing (four studies), and health sciences including podiatry, occupational therapy, physiotherapy and graduate nursing (two studies).

The research included MBI's with the intention of improving mindfulness, self-care, engagement in academic learning, empathy and reflective practice. Specific programs based on mindful meditation, loving kindness, mindful movement, Zen, vipassana, mindfulness-based stress reduction (MBSR) and mindfulness-based cognitive therapy (MBCT) were included. A review of controlled studies identified positive outcomes of mindfulness training in relation to decreasing anxiety, depression and stress and increasing positive mood states, mindfulness, empathy and self-efficacy in health profession students (McConville et al., 2017). Changes in stress and anxiety were maintained at follow-up.

The researchers also suggest that factors including content, mode of delivery, total length of time students engage with mindfulness meditation and mindfulness practice, the student professional group, where in the course of study the intervention is situated and whether the program is optional or compulsory may contribute to the effectiveness of the intervention (McConville et al., 2017). These results highlight the need to consider and target specific developmental stages and disciplines, such as EA medical students, when adapting and implementing MBI's.

Interventions included MBSR, both in longer (i.e., 1.5 – 2.5 hours for 7-10 weeks) and shorter formats (i.e., 1.5 hours over 4 weeks). Three studies used a program adapted from MBCT and MBSR called Mindful Gym, a shorter program (i.e., 2-3 hours over 4 weeks). Two studies used a self-help delivery via CD of the Mindful Gym program (i.e., 5-week delivery) and a 30-minute guided meditation practice via CD for 8 weeks. One study used a brief intervention comprising 10-minute mindfulness training and five minutes discussion integrated into 28 classes. Three studies used only mindful meditation for 28-30 days. Control groups included no MBI (10 studies), wait-list (4 studies), initial one hour lecture, activity in another room, usual care, Mindful Gym CD six months post-conclusion of study and seminar series on complimentary medicine.

Results showed MBSR had a larger effect than mindful meditation alone, suggesting the importance of; a) taking a multidimensional approach including evidence and psychoeducation supporting mindfulness in stress reduction, b) introducing different mindfulness-based practice options (e.g., body scan, informal/formal meditation, mindful movement) and c) discussing the application of mindfulness and sharing experiences with peers (McConville et al., 2017). These aspects may improve engagement with university students; however, this research does not specify age range of participants and specific research is needed targeting EAs – 18-29 years to ensure interventions are preventative and

developmentally appropriate. Overall, the results found that both the longer and shorter MBSR, Mindful Gym (both in person and DVD) were effective in increasing mindfulness, self-efficacy and decreasing stress and mental distress (Phang et al., 2015; Phang et al., 2015). Decreases in stress and anxiety and increases in mood occurred irrespective of student group when the intervention was based on MBSR or MBCT, inclusive of students from southeast Asia, America and Australia (McConville et al., 2017).

Larger effect sizes were observed were observed in studies where greater time was spent in formal and informal mindfulness practice (i.e., in the MBSR programs) compared to the shorter mindfulness meditation only programs. This suggests time spent in mindfulness meditation practice may influence intervention effectiveness and adherence to independent meditation practise may present as a challenge for students with high study loads (McConville et al., 2017). Home based practice generally decreased post-intervention, resulting in increases in stress and anxiety at follow-up (Erogul et al., 2014; Phang et al., 2015; Phang et al., 2015). Therefore, identifying barriers to regular practice and developing appropriate reminder systems may promote ongoing benefit (McConville et al., 2017). This component of the research highlights the importance of targeting different developmental stages in understanding MBI effectiveness, as this crucial component may differ depending on the target age.

Furthermore, MBI's were offered during early years of health degrees, later years, across multiple years, in graduate programs and during clinic training. As there was no standardisation between the timing of the programs, it is not possible to compare the effect of the timing of each intervention (McConville et al., 2017). Compared with curriculum based MBI's, optional programs are associated with higher levels of student satisfaction, although factors such as program timing and perceived relevance of the program may impact this (McConville).

Generally, however, MBI's incorporate a structured approach with sessions of approximately 1.5 hours and meditation homework between sessions, with a limit on facilitating groups of approximately 12 participants to optimise positive effects and peer interactions (Dobkin & Hutchinson, 2013). The metaphors, language and materials used should be diverse in delivery and relevant to the population with a typical focus on targeting stress and anxiety specifically and facilitation is recommended to work to address scepticism and build motivation (Wolf & Serpa, 2015). It is also proposed that programs aim to foster

connection and relationship to self and others, creating a supportive and interactive environment for participation.

Table 29 below summarises some of the components identified within the research as being effective and important when implementing MBI's with medical students.

Table 29

Aspects of MBI's Identified as Effective with Medical Students (Dobkin & Hutchinson, 2013)

Effective MBI Components with Medical Students
• The commitment represented through program engagement to manage stress effectively in the student's life
• The impacts of group dynamics and sharing of experiences with other students undergoing similar experiences
• The didactic content of the course, including learning about how the mind works, how stress impacts life, means of coping with stressors and importance of self-care
• The experiential aspect of MBI's
• The effect of developing an ongoing meditation practice
• The impact of role-modelling by instructors

A recent study conducted by Kakosche et al (2021) evaluated a 5-week mindfulness-based lifestyle course that was delivered to a first-year undergraduate medical student students (n=205) as part of the core curriculum. This study investigated the effects of the program on mental health, perceived stress, study engagement, dispositional mindfulness, and whether any improvements were related to amount of formal and/or informal mindfulness practice. The results showed significant improvements in self-reported mental health, perceived stress, study engagement, and mindfulness all improved from pre- to post-intervention (all p values < .001). Improvements in all outcomes were positively related to informal practice quality while improved mindfulness scores were related to formal practice (all p values < .05). Overall, this study provided support for the implementation of a 5-week mindfulness-based program improving psychological wellbeing and study engagement in medical students via both informal and formal practice (Kakosche et al., 2021).

The Inclusion of Loving-Kindness Meditation

LKM, or metta, has been described as a form of meditation used to promote feelings of warmth and caring for the self and others (Salzberg, 1995). The term "metta" is drawn from Pali, the ancient Buddhist language, and refers to a mental state of unselfish and

unconditional kindness, benevolence, and friendliness to all beings (Hofmann et al., 2011). While mindfulness meditation is primarily cognitive in nature, LKM incorporates more emotional aspects of experience and is intended to promote affective balance (May et al., 2014). LKM includes directing feelings of loving-kindness towards the mental images of self, selected individuals and more expansively, all living beings. During the meditation, the meditator attempts to generate genuine desire that their selected individual be happy, healthy, safe, peaceful and free from suffering (Salzberg, 1995).

Unlike MBCT, which focus primarily on psychological symptomatology, LKM builds upon the participant's strengths. This approach is like that espoused in positive psychology theory and practice, in which the development of resilience is a common goal (May et al., 2014). Furthermore, meta-analyses suggest that LKM interventions improve health and wellbeing more generally, and positive emotions more specifically in clinical and non-clinical populations (Zeng et al., 2015; Galante et al., 2014). For instance, LKM has been shown to enhance daily experiences of positive emotions in working adults (Fredrickson et al., 2008). Regarding university students, only a few studies have examined the effect of LKM on positive emotions (May et al., 2014) and reducing distress (Totzeck et al., 2020). The utility of LKM as an effective intervention with university students requires further study.

Interestingly, Fredrickson and colleagues (2008) found LKM intervention group initially reported lower levels of positive emotions after commencing meditation practice. Frederickson et al. hypothesised this finding is reflective of the inherent difficulties in initiating any self-change effort. Commencing a meditation practice may be perceived by novice meditators as something unfamiliar, difficult and without immediate rewards. Kabat-Zinn (2005) identified five difficulties facing novice meditators: craving, anger, boredom, restlessness, and doubt. These difficulties are believed to result from increased awareness of commonly present challenging inner states that were previously unnoticed prior to meditative practice. Fredrickson and colleagues (2008) suggested that participants need about one to two weeks of practice before they find LKM beneficial. Follow-up results however showed that all participants, regardless of whether they continued meditating, maintained the gains in personal resources (e.g., resilience, mindfulness) gained in the initial intervention. This finding suggests that the LKM intervention can benefit both meditators and non-meditators alike.

Germer (2009) has argued that individuals need self-compassion if they are to show compassion for others. Consistent with this aim, LKM promotes the development of an

affective state of unconditional kindness to all people, including the self. Given the high stress and caring nature of the work performed by the participants, the development of self-compassion also appears important in this context. Despite the apparent link between LKM and the development of self-compassion, there is limited research exploring this with EA medical students. The current research addressed these gaps.

In a pilot study with undergraduate students, Richards and Martin (2012) explored whether a program combining mindfulness and LKM would raise levels of self-compassion in a brief time. The researchers compared a waitlist-control condition (n = 16) to an intervention condition (n = 18) whereby participants received a mindfulness intervention integrated with LKM. The mindfulness and loving-kindness integrated intervention included two, five-hour long group teachings and daily online booster tasks for two weeks. Using Neff's Self Compassion Scale, the results showed the mindfulness and loving-kindness intervention resulted in significant increases in student self-reported self-compassion. This pilot study shows the benefit of integrating mindfulness with loving kindness as an intervention for university students, also supporting the use of such an intervention in a brief format.

May et al. (2014) also explored the efficacy of a self-training program focused on loving-kindness among university students. The authors found increases of positive affect and decreases of negative affect right after meditation practice. Totzeck et al (2020) found significant reductions in DASS-21 scores (stress, anxiety and depression) in university students (n=110) following LKM interventions over a six-month period. The inclusion of LKM within MBI programs may therefore be a potentially efficacious and cost-effective intervention to increase mental health in students; providing low-threshold treatment without stigmatization, can be conducted in group settings, and can be easily practiced almost everywhere.

By decreasing psychological distress and increasing aspects such as positive emotions, mindfulness and self-compassion, MBI's have the potential to improve health student well-being, and facilitate a more patient-centred and psychosocial approach to patient care (Beach et al., 2013). The inclusion of optional MBI programs which incorporate LKM into health-based programs, such as medicine, may increase student's ability to be present, open and responsive to clients, as well as assisting to foster professional practice standards and competencies relevant to professional, communicator and reflective practitioner roles, competencies in managing mental health and resilience, communication, and client centred models of practice (McConville et al., 2017). Researchers have concluded that universities

should employ preventive interventions that potentially reach larger groups of students and not merely rely on individual counselling services (Regehr et al., 2012). Despite this understanding, limited Australian based universities are developing and implementing MBI's of this nature with medical students that take into account young people's developmental stages or degree timing. The current research aimed to address these gaps.

Mindfulness Facilitator Competencies

In addition to discussing the components of MBI's which promote effectiveness, there is an ongoing discussion in the mindfulness community about identifying the specific competencies of a mindfulness facilitator and describing the optimal path by which these skills can be acquired, appropriately demonstrated and evaluated (Wolf & Sepra, 2015). There is wide consensus that facilitator competencies are needed not only to operationalise and standardise mindfulness-based research but also ensure that the essence of the teachings remain. MBI's generally encompass a variety of evidence-based approaches, each with some unique components and needed skills and knowledge. Crane et al (2012) suggests there is a great opportunity for healing made possible by the broader spread of MBI's as well as "the inherent risk that the spread of mindfulness itself leads to a dilution of its integrity (Wolf & Sepra, p. 51).

Crane et al (2012) published the Mindfulness Teaching Competency Domains. Table 30 below is an overview of these six domains.

Table 30

Six Competency Domains for Mindfulness Teaching (Crane et al., 2012)

Six Competency Domains for Mindfulness Teaching
• Coverage, pacing and organisation of session curriculum
• Relational skills
• Embodiment of mindfulness
• Guided meditation practices
• Conveying course themes through interactive inquiry and didactic teaching
• Holding of the group learning environment

Wolf and Sepra (2015) also emphasise the importance of two characteristics as essential for the mindfulness teacher to promote intervention effectiveness – embodiment and resonance. These qualities are deepened through personal and interpersonal mindfulness practice. These two aspects outlined by Wolf and Serpa are discussed below.

Embodiment

The teacher who embodies the practice of mindfulness shows a consistency of qualities such as calm, kindness and nonreactivity. These aspects are part of a professional skill set, extending beyond the classroom and integrated to their very being. This concept has been described as a facilitator being the practice, rather than simply doing it. The teacher who embodies mindfulness brings more than just a conceptual understanding. Through the teacher's own depth of mindfulness practice, they know, understand and can discuss the subtleties of the workings of the heart and mind in a way that resonates and inspires students to open to their own experiences in a novel way (Wolf & Serpa, 2015).

Resonance

Resonance serves as an example of how ancient practices such as mindfulness meditation are increasingly understood through modern neuroscience, and how attending to the present moment with loving-awareness connects to the neurobiology of attachment (Wolf & Serpa, 2015). More specifically, the concept of limbic resonance has been proposed to describe not only the capacity but also the mechanism for deep emotional attunement or sharing of experience that occurs in the brains limbic system (Lewis et al., 2000). This occurs on the verbal and non-verbal level and is considered an essential mechanism for healing in various psychotherapy approaches. There is an attunement to others through the function of mirror neurons and neurotransmitters like dopamine that result in feelings of pleasant connectedness (Wolf & Serpa). Jack Kornfield describes this meeting of an ancient practice (i.e., mindfulness meditation) and modern neuroscience:

> "Each time we meet another human being and honour their dignity, we help those around us. Their hearts resonate with ours in the same way the strings of an unplucked violin vibrate with the sounds of a violin played nearby. Western psychology has documented this phenomenon of "mood contagion" or limbic resonance. If a person filled with panic or hatred walks into a room, we feel it immediately, and unless we are very mindful, that person's negative state will begin to overtake our own. When a joyfully expressive person walks into a room, we can feel that state as well" (2009, p.17).

These components highlight the importance for teachers implementing interventions with EAs, and indeed all population, to have cultivated their own practice in order to maximise MBI effectiveness. When considering both the developmental stage, vulnerability to psychological distress, and therefore young people's likelihood of limbic resonance with

these emotional states, the potential role of both teacher and MBI is to model a difference resonance and guide in the development of skills to foster loving awareness, resilience and growth.

Potential Challenges to Implementing Mindfulness-Based Interventions in University Settings

There are several practical challenges reported by developers/implementers of MBIs within the university setting which are worthy of consideration. These include: (a) the need for continued development and refinement of the best practices for adapting well established adult mindfulness training for EA populations; (b) lack of agreement on the active ingredients of the programs and ways to measure their effectiveness through rigorous scientific research; (c) motivating universities to embrace the programs (d) frequent changes in universities educational policies, budgeting, priorities, proposed solutions, and decision makers; (e) the need for funding; (f) finding trained and experienced mindfulness teachers to teach both students and staff is applicable; and (g) scheduling teaching in multiple faculties, including finding a suitable time within the curriculum, and finding space conducive to practice within the university.

These identified challenges point to the indispensable role that ongoing research will need to play in broadening the credibility and appeal of mindfulness training for EA university students. This thesis aimed to address these gaps by providing both an effective framework and MBI with a population (i.e., medical students), where the workload demands exceed many other programs.

Model of Eudaimonic Integration as a Guiding Framework

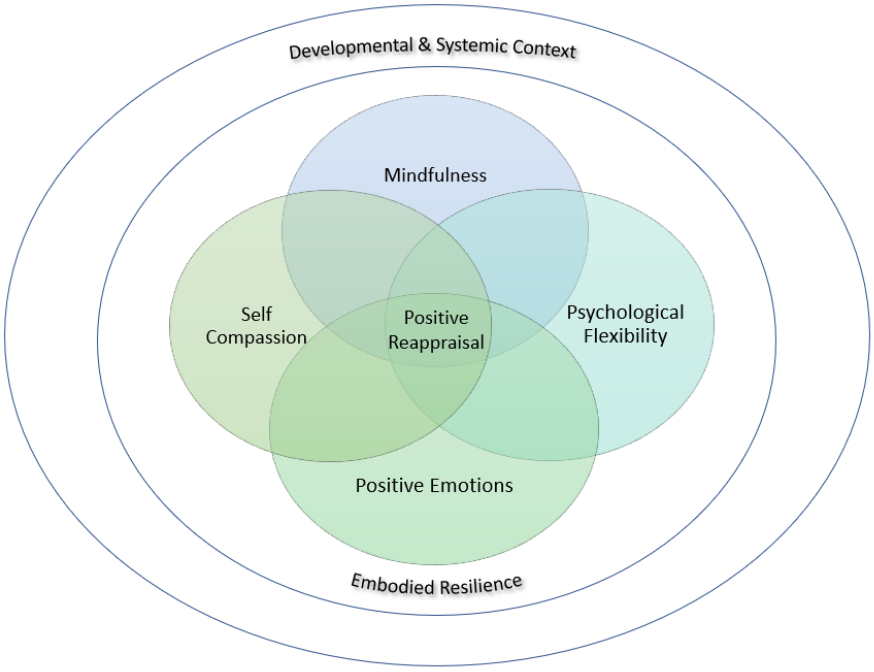
Study 2 demonstrated efficacy for the newly proposed MEI with EA university students from Australia. Specifically, this model established the essential role of mindfulness, self-compassion and psychological flexibility as predictors of positive re-appraisal and young people's experience of increased positive emotions. The MEI also demonstrated significant associations with higher resilience and satisfaction with academic experience, as well as lower perceived stress and psychological distress (See Chapter 5, Study 2, p 130). Evaluation of the MEI also included examination of the five subscales of the FFMQ separately to determine the strength and direction of each subscale as predictors of factors within the MEI: psychological flexibility, self-compassion, positive emotions and positive re-appraisal. Results highlighted that whilst mindfulness is overall a significant predictor of each identified mechanism within

the MEI, further investigation of each separate subscale assists to determine the varying degrees in which each facet was effective on cultivating separate elements.

The MEI is proposed to form the basis for a newly developed pilot MBI with EA medical students at Bond University (Australia). The model forms a useful structure upon which educational, preventive and therapeutic approaches can be built, and is readily adaptable for other populations including adult university students, the general university population, health professionals, individual patients, targeted groups, practice populations or public health campaigns. Figure 10 below shows the MEI.

Figure 10

Model of Eudaimonic Integration



Note. A graphical depiction of the MEI. A longitudinal process model of mindful emotion regulation (both positive and negative) and quality and integration of relational systems (with self, others, and world), promoting response flexibility, positive emotion regulation and compassion as a foundation for beneficial meaning making of life events and challenges, which in turn, fosters resilience, growth, and personal potential during EA. The model forms a useful structure upon which educational, preventive, and therapeutic approaches can be built, and is readily adaptable for other populations including adult university students, the general university population, health professionals, individual patients, targeted groups, practice populations or public health campaigns.

Hypothesised Ways the Model of Eudaimonic Integration Informs Mindfulness-based interventions

When facing the normative developmental stressors and associated with transition to university and first life cycle transition of launching from family of origin, MBI's designed to

foster skills identified within the MEI are hypothesised to support resilience and well-being. More specifically, MBI's built on this model foundation are proposed to enhance student ability to appraise everyday situations as normative and even beneficial experiences for growth. In stressful situations, mindful and compassionate students are proposed to be more flexible in perspective taking, shifting towards more adaptive appraisals, experiencing more positive emotional states and overall employing a wider range of coping resources to enhance resilience. Below is a description of more specific outcomes of MBI's developed on the structure of the MEI.

Enhancing Adaptive Appraisals

When facing change and transition the initial stress appraisal process may be supported by MEI skills to promote assessments of demands more adaptively as normative learning opportunities in life. Mindful-compassionate students may feel more confident in being with and adapting to the challenges at hand. Greater psychological flexibility skills may also promote the contextually appropriate appraisal of normative daily situations and reflect in lower distress during young university student's experiences (Bonanno & Burton, 2013). During the process of secondary appraisal of a stressor in which the student assesses available coping resources, mindful-compassionate students may be more skilled at bringing awareness to reactivity in responses, being with this experience (i.e., thoughts, sensations, emotions) and moving through this to shift this state to one of observation and then response (Dvorakova et al., 2018; Farb et al., 2013).

This concept is supported by the previously discussed, Mindful Coping Model (Garland et al., 2011) which describes the process of positive re-appraisal as occurring via the process of decentering or reperceiving (Shapiro et al., 2006), when the individual actively disengages from the initial unhelpful judgement and via metacognitive states of awareness, moves or shifts their internal state towards helpful experiences and a relationship with the stressor that promotes positive meaning making. Again, a key mechanism is psychological flexibility, which promotes a broad and flexible space for cognitive reframing to occur. A student's capacity to make positive meaning during the appraisal process may broaden their concept of self and beliefs about the world, strengthening their ability to adaptively manage future challenges (Dvorakova et al., 2018; Fredrickson, 2001). By turning towards unpleasant experiences in an aware and relaxed, non-attached manner, the mindful-compassionate student may transform habitual emotional reactions and conditioned patterns. Allowing young people to move into adulthood with a solid foundation of resilience.

Enhancing Adaptive Coping Resources

Mindfulness and self-compassion skills are proposed to enhance adaptive coping skills such as problem solving, emotional awareness, emotional processing, self-regulation and meaning making. By using mindful somatic awareness, EA university students may be more able to self-regulate and mindfully observe experience via techniques such as body scan. Through lowered reactivity to thoughts, feelings and sensations associated with an event, as well as acceptance of unpleasant experience, young students can better care for their difficult experiences and choose their response.

Furthermore, through greater psychological flexibility, greater coping resources may be promoted and engaged. For example, the student who misses their family of origin, and has just recently launched from the family home may feel lonely, isolated and homesick. They may reflect on how much they miss the familiarity of home, there family relationships and role and consequently identify the importance of close, safe relationships for every human being. The student, possessing skills identified within the MEI, may notice habitual reactive thoughts and coping patterns, including thoughts of not being good enough or fitting in, engagement in strategies such as overeating, excessive screen time or alcohol use to avoid their unpleasant experience. Through increased awareness, flexibility and self-compassion, the student may feel encouraged to consciously respond to these unpleasant experiences by scheduling pleasant self-care activities, contacting family and close friends for support, engaging in university interest activities to meet like-minded people or expand the limits of their comfort zone by participating in new activities or groups.

Enhancing Compassionate Reflections During and Post Events

Following any stressful event and associated response, there is an opportunity to reflect and evaluate the process and consequences and any future implications (Skinner & Beers, 2016). Reflecting on the impact and effectiveness of one's coping, integrating these reflections and insights, and maintaining a compassionate relationship to self during the post coping process represent important aspects of self-awareness and regulation, resilience and developmental growth (Dvorakova et al., 2018). Being able to reflect in this way may promote adaptive stress recovery from current circumstances and enhance coping skills and readiness for future events.

Furthermore, by targeting both mindfulness and self-compassion skills students may be better skills at recognising unhelpful thinking patterns such as rumination or catastrophising, and flexibly move towards thinking which aims to identify the benefit of the

experience for growth and learning (i.e., positive re-appraisal). Previous research has identified that engagement in healthy reflections both during and following events aid recovery and promote healthier future appraisals and coping strategies (Cho et al., 2016; Kok & Fredrickson, 2010).

Whilst mindfulness and self-compassion are highly interrelated, targeting these components specifically via targeted MBIs can assist to maximise student well-being. Skills in these areas include conscious regulation of attention, awareness of self (body and mind), awareness and compassionate understanding of others, attitudes of openness, curiosity, and care for self and others. The MEI provides a clear framework for relevant interconnected factors for effective MBIs to target in this population.

Pilot Mindful Awareness Resilience Skills Training Program

Table 31 below outlines the content of the six-session pilot MARST-P developed as a part of the current program of research.

Table 31

Overview of the Content of the Six Session Mindful Awareness Resilience Skills Training Program

Session	Session Overview
One	• Review content of MARST-P objectives, guidelines, and schedule. • Psychoeducation on the stress response, resilience, and mindfulness. • Handout: Identifying stress symptoms • Home activities and resources provided (including pause bracelet).
Two	• Weekly review and debrief • Introduction to formal and informal mindfulness practice • Guided informal and formal mindfulness meditation practice. • Benefits of mindfulness • Introduce and practice mindfulness with loving kindness meditation. • Psychoeducation and practice application of the Mindful Awareness Integration Tool. • Home activities
Three	• Guided mindfulness meditation practice. • Weekly review and debrief • Psychoeducation on the cognitive model • Practice formal mindfulness of thoughts meditation • Practice application of the Mindful Awareness Integration Tool • Handout: Forming an informal and formal mindfulness routine • Group discussion and feedback
Four	• Guided mindfulness meditation practice. • Weekly review and debrief • Psychoeducation around avoidance of emotions • Handout: Identifying unhelpful strategies for managing emotion • Guided formal meditation on emotion • Group discussion and feedback
Five	• Guided mindfulness meditation practice. • Weekly review and debrief • Introduction to self-compassion and the benefits • Guided Loving Kindness Meditation • Social supports and connections • Handout: Connection and Compassion • Group discussion and feedback
Six	• Guided mindfulness meditation practice. • Weekly review and debrief • Relapse prevention – self-care plan • Program review and reflections (feedback and discussion)

The six session MARST-P group program was informed by the MEI which showed clear outcomes for building resilience, positive re-appraisal and decreasing psychological distress in the general EA university population studying in Australia in Study 2. MARST-P was designed to be evaluated with a student population of EA medical students in Australia,

considered a sub-group at higher risk for stress and psychological distress. The program aimed to target the hypothesised ways (outlined above) in which the MEI promotes resilience, positive reappraisal and psychological well-being in this population.

Adapting the 2-day MARST-P program the PhD researcher developed a six-session program protocol, weekly session materials and handouts for the revised MARST-P as part of the current pilot research with EA medical students. Pilot MARST-P was created specifically for EA university students and incorporates aspects such as psychoeducation around the stress and relaxation response, formal and informal mindfulness training, cognitive therapy strategies to increase awareness and cognitive re-appraisal skills, LKM, exploration of social support systems and relapse prevention strategies designed to reinforce skills and develop a self-care plan. Appendix J presents an overview of the six session MARST-P and Appendix K provides a sample handout. The six group sessions are being facilitated by the PhD researcher (a Clinical Psychologist with over 10 years meditation experience) with EA medical students from Bond University, Queensland Australia.

Guided by the results of both previous MBIs as well as outcomes regarding Study 2, a combination of specific informal and formal mindfulness meditations were included in the program. For example, some of these included meditations such as body scan, mindfulness of breath, walking meditation, LKM and were designed to target the MEI components as well the specific FFMQ subscales identified as greatest predictors of the model to enhance intervention effectiveness.

Conclusion

The review of the literature indicates the emerging theoretical and empirical nature of the constructs reviewed and indicates gaps in approach and research methodology. Despite the apparent consensus regarding the increased vulnerability and psychological distress within EA university and medical students, a lack of research has systematically examined factors underpinning resilience within this population. As a result, a lack of validated and theoretical models of resilience exist to provide guidance for interventions aimed at cultivating resilience in this population. This research appears crucial and particularly relevant in the recent context of the Australian Government's higher education policy which aims at improving student outcomes.

Based on the evidence supporting the MEI, this chapter aimed to review the development of MBIs with the target population. More specifically, this chapter outlined qualities of both the facilitator as well as specific intervention aspects that enhance effectiveness

with EAs. Facilitators must possess both embodiment and resonance skills to maximise student outcomes, and act as a role model for practice. Interventions with medical students must aim to engage students and promote both experimental learning and sharing of experience. Effective interventions also include psychoeducation and encourage commitment to an ongoing meditation practice.

This chapter highlighted the hypothesised ways in which the MEI informs the development of MBIs designed to promote resilience in EA medical students, via enhancing flexible and adaptive appraisals, enhancing coping resources and compassionate reflections both during and following events. Finally, to address previously identified research gaps pertaining to the development of both frameworks and interventions with this population, an outline for the six-session pilot MARST-P developed as a part of the current program of research was proposed. The program was informed by the MEI and is designed to target resilience, positive re-appraisal and decrease psychological distress in EA medical students from Australia

CHAPTER SIX
STUDY THREE: RANDOMISED CONTROL TRIAL OF THE PILOT SIX-SESSION MINDFUL AWARENESS RESILIENCE SKILLS TRAINING PROGRAM

Chapter Overview

Understanding how to support EA university students' successful adaptation and sense of well-being have been identified as essential for maximising emotional, academic and social outcomes, and lay the foundations for successful transition into adulthood. Despite this clear understanding and recommendation, a lack of validated models and evidence-based interventions exist to address these clear research gaps. Study 2 proposed and evaluated a new resiliency model for EA university students, the MEI. The study highlighted the role of mindfulness in the promotion of a range of resources including psychological flexibility, self-compassion and positive emotions, and the role of these resources as mechanisms for positive re-appraisal capacity in the EA university student. Efficacy for the MEI as a guiding framework for increased resilience and reduced perceived stress and psychological distress was established.

Whilst Study 2 provides a validated model and guiding framework for the development of effective MBI's with EA university students, Chapter 5 outlined there is currently a paucity of effective MBI's with this population. Furthermore, despite being an at-risk population limited MBI's have been developed and evaluated with at-risk populations such as EA medical students, particularly within Australian university settings. Furthermore, whilst limited MBI's have been evaluated with university students, there is a paucity of research which has attempted to consider the unique developmental, environmental and systemic considerations associated with this developmental stage and to formulate appropriate intervention support accordingly.

This chapter outlines Study 3, which aimed to determine the efficacy and effectiveness of the pilot six-session MARST-P in targeting and enhancing resiliency factors identified within the MEI with an at-risk population of EA medical students studying in Australia. Overall, this research aims to inform university policy pertaining to both the general and at-risk EA populations within university contexts.

Hypotheses for the study are divided into two sections. Part A of the study evaluated the efficacy of MARST-P by assessing differences between the Intervention and Waitlist-Control Groups across variables within the MEI. Specifically, whether there was a statistically

significant difference between groups on measures of mindfulness, psychological flexibility, self-compassion, positive emotions and self-compassion at pre, post and one-month follow-up. Group differences were also assessed across these three time points for resilience, perceived stress, and psychological distress. Secondly, to obtain collateral data via physiological measures Part B of the study examined differences and percentage change of spot cortisol assays taken pre, post and one-month following the MARST-P intervention. A description of the hypotheses for each part of the study is listed below.

Hypotheses

Hypotheses: Part A

1. Hypothesis 1 predicted that compared to the Waitlist-Control Group, the Intervention Group would report significantly higher mindfulness, psychological flexibility, positive-reappraisal, self-compassion, positive emotions and resilience from pre to post intervention. These significant differences were predicted to be maintained at one-month follow-up MARST-P intervention.
2. Hypothesis 2 predicted that compared to the Waitlist-Control Group, the Intervention Group would report significantly lower perceived stress and psychological distress from pre to post intervention. These significant differences were predicted to be maintained at one-month follow-up MARST-P intervention.

Hypothesis: Part B

3. Hypothesis 3 predicted that compared to the Waitlist-Control Group, the Intervention Group would demonstrate lower spot cortisol assays at post and one-month follow-up intervention. No significant differences are predicted between groups at baseline measurement.

Method

Study Design and Participants

The study was a single-blind, group randomised waitlist-controlled trial examining the MARST-P (intervention) verses waitlist-control (non-intervention) conditions. Participants were recruited from the Bond University Medical School via email advertising which included a flyer and brief presentations delivered by the PhD researcher, a registered Clinical Psychologist to the medical school at Bond University (see Appendix L). The intervention trial was also advertised within university notice boards and medical students could self-refer. Inclusion criteria included being aged between 18 and 29 years and currently enrolled in and completing a medical degree at Bond University, Australia. Exclusion criteria were a current major depressive episode; current or past psychosis, including bipolar disorder; persistent self-harm needing clinical management or therapy; and formal concurrent psychotherapy.

Participants who expressed interest in the trial were screened by the PhD researcher in person to establish potential eligibility. During this screening interview, Explanatory Statement and Consent Form were provided. Participants completed the Depression Scale and Anxiety Scale of the Depression Anxiety Stress Scales (DASS-21; Lovibond & Lovibond, 1995) as a screening tool for a current major depressive episode. Appropriate risk assessment was conducted to assess suicidal ideation or self-harm, as well as information gathered pertaining to current or past psychosis and therapy engagement. For those participants not meeting inclusion criteria, appropriate alternative support options were recommended during this interview. The study (RO 1920) was approved by Bond University Human Research Ethics committee (BUHREC) for the current study. The trial was conducted and reported in accordance with CONSORT guidelines. All participants provided written informed consent. Table 32 below shows the descriptive statistics for the study.

Table 32

Descriptive Statistics for the Study Sample (n = 52)

		Count	Layer N %
Gender	Male	14	26.9%
	Female	38	73.1%
Highest Education Completed	Completed Year 10 or 12	42	80.8%
	Undergraduate Degree	6	11.5%
	Postgraduate Degree	4	7.7%
University Status	Full-time	52	100%
	Part-time	0	0%
Current residence	On-Campus	29	55.8%
	Family Home	6	11.5%
	Off Campus Accommodation	13	25%
	Own Home	4	7.7%
Employment status	Full-Time (30+ Hours)	0	0%
	Part-Time (15-30 Hours)	1	1.9%
	Casual (1-15 Hours)	9	17.3%
	Not Working	42	80.8%
Concerns regarding funds	Yes	17	32.7%
	No	35	67.3%
Mindfulness Training in the Past Year	Yes	8	32.7%
	No	44	84.6%
Do you Meditate	Yes	11	21.2%
	No	41	78.8%

Randomisation Process

Participants were randomly allocated with a computer-generated random number sequence (in a 1:1 ratio) to receive either the pilot 6-week face to face MARST-P intervention or to the non-intervention (Control) group. The randomisation of participants to groups was implemented as follows: a table of random numbers was generated, and the PhD researcher assigned participants to the trial groups based on this. The table of random numbers was generated using the Random Number Generator from http://stattrek.com/statistics/random-number-generator.aspx. Following the randomisation process, the trial administrator informed participants of the outcome of randomisation via an individual and confidential email sent directly to the email address provided by each participant with an allocation letter attached (See appendix L).

In view of the nature of the in-person intervention, participants and PhD researcher facilitating the program were aware of treatment allocation. All participants assigned to the Waitlist-Control Group were offered the opportunity to complete the MARST-P at the end of

the trial, with the program commencing for the Waitlist-Control Group immediately after follow-up data was collected in the initial trial.

Procedure

The pilot six-session MARST-P is a group-based skills training program designed to enable participants to learn mindfulness skills that improve resilience and reduce perceived stress and psychological distress. The program is based on third wave cognitive approaches such as Mindfulness-Based Cognitive Therapy (MBCT) and Acceptance and Commitment Therapy (ACT). The program aimed to assist individuals to learn to become more mindful and resilient during times of stress by increasing awareness and acceptance regarding bodily sensations, thoughts and feelings associated with stress and suffering. The program also aimed to provide skills regarding how to relate adaptively to these experiences. Participants learn mindfulness practices and cognitive-behavioural skills both in session and through homework assignments.

The group facilitator provided support to participants by teaching skills in how to respond adaptively to thoughts, feelings and experiences in the present moment. The pilot six-session MARST-P also incorporated a central focus on understanding and increasing self-compassion, primarily through psychoeducation, specific meditations and experiential exercises to provide an expanded and unique element in comparison to previous program versions. The pilot six-session MARST-P was adapted specifically for EA university students and incorporates exploration of social support systems and relapse prevention strategies designed to reinforce skills and develop a self-care plan.

The MARST-P was authored by the PhD Researcher and Principal Supervisor and developed specifically as a part of this program of research. The aim of developing this program was to assess overall effectiveness and efficacy at targeting the identified components of successful adaptation during EA identified within the MEI outlined in Study 2 within this body of research. The PhD researcher developed a program protocol, weekly session materials and handouts for the MARST six session program as part of the current pilot research with EA medical students. Appendix J presents an overview of the six-session MARST-P.

The current pilot program consisted of 6 x 1-hour group sessions, delivered over consecutive weeks with one booster session offered at 4-week follow-up. Sessions were facilitated solely by the PhD researcher (a Clinical Psychologist) with EA medical students at Bond University, Queensland Australia. Prior to commencing the trial groups, the facilitator

received training in the administration of mindfulness and cognitive based therapies and group facilitation, was an endorsed Clinical Psychologist and received specific training from the principal supervisor (a Clinical Psychologist) in delivering previous versions of the two-day MARST-P. The facilitator also had regular and independent clinical supervision regarding group facilitation and processes. See Table 31 above for an overview of the pilot six-session MARST-P. Participants were assessed at three timepoints: baseline (before randomisation), at the end of the 6-week MARST-P Intervention and at 1-month post intervention. All participants in the Waitlist-Control Group were offered the opportunity to participate in the same intervention program following completion of collection of follow-up data.

Materials

Participants in both the Intervention Group and the Waitlist-Control Group were assessed across a range of self-report measures specifically at three separate time points: pre, post and one-month follow-up. Below is a description of the self-report questionnaires administered at these times. The explanatory statement and questionnaire package utilised in the study are presented in Appendices F, H and I).

Demographic Questionnaire

Participants were asked to provide information regarding gender, age, level of study, employment, current living situation and any concerns about funding university studies that year as well as meditation practices.

Process Measures

Five Facet Mindfulness Questionnaire (Baer et al., 2006). The FFMQ (Baer et al., 2006) is a 39-item self-report instrument developed to assess the general tendency to be mindful in everyday life. Participants indicated the frequency with which each statement describes themselves on a five-point Likert scale ranging from 1 = never or very rarely true to 5 = very often or always true. The scale comprises five subscales: Observing, Describing, Awareness, Non-judging of inner experience, and non-reactivity to inner experience. Sample items include: “I pay attention to how my emotions affect my thoughts and behaviour” (observing); “I can easily put my beliefs, opinions, and expectations into words” (describing); “I rush through activities without being really attentive to them” (acting with awareness; reverse scored); “I tell myself I shouldn’t be feeling the way I’m feeling” (non-judging of inner experience; reverse scored); and “I perceive my feelings and emotions without having to react to them” (non-reactivity to inner experience). The authors suggest examining each

subscale separately for analysis, however numerous studies have demonstrated sound psychometric properties by utilising a total mindfulness score, calculated by summing subscale totals (e.g., Garland et al., 2011). The facet scales have shown adequate to good internal consistency, with Cronbach's alpha coefficients ranging from .75 to .91 (Baer et al., 2008). Cronbach's alpha for the current study was .85.

The Acceptance and Action Questionnaire (Bond et al., 2011). The AAQ-2 (Bond et al., 2011) is a 7-item self-report scale that measures psychological inflexibility. Participants rate the degree to which worry, and emotional distress interferes with their life. Items are rated on an 8-point scale ranging from 0 = (never true) to 7 = (always true), with higher scores indicating higher psychological inflexibility and lower scores indicating greater psychological flexibility. Sample items include "I worry about not being able to control my worries and feelings," and "emotions cause problems in my life." Mean reliability has been reported as .84 in postgraduate and community samples (Bond et al., 2011). The AAQ-2 has also been shown to have satisfactory validity and appears to measure the same construct as the Acceptance and Action Questionnaire-I (AAQ-1;), but with better psychometric consistency. The mean value of Cronbach's α in the current study was .91.

The Self-Compassion Scale (Neff, 2003). The SCS is a 26-item self-report scale measuring six facets of self-compassion for individuals 14 years and older: self-kindness, self-judgment, common humanity, isolation, mindfulness, and overidentification. Participants rate their level of self-compassion with items rated on a 5-point scale ranging from 1 = (almost never) to 5 = (almost always). Sample items include "I try to be loving towards myself when I'm feeling emotional pain" and "I'm disapproving and judgmental about my own flaws and inadequacies." Subscales are computed separately prior to reverse scoring. For computation of total self-compassion score, self-judgement, isolation and overidentification subscales are reverse scored and then all items combined for a total score. The scale has demonstrated strong reliability with Cronbach's alpha reported to be .86 (Neff et al., 2019). The scale has also been shown to have satisfactory validity (English version; Raes et al., 2019). The mean values of Cronbach's α in the current study was .93.

Positive and Negative Affect Schedule (Watson et al., 1988). The PANAS consists of two 10-item mood scales and was developed to provide brief measures of positive affect (PA) and negative affect (NA). The items were derived from a principal components' analysis of Zevon and Tellegen's (1982) mood checklist; it was argued that this checklist broadly tapped the affective lexicon. Respondents are asked to rate the extent to which they have

experienced each emotion within a specified time period, with reference to a 5-point scale. Items are rated as: 1 = very slightly or not at all, 2 = a little, 3 = moderately, 4 = quite a bit and 5 = very much. Sample items include Proud, Hostile, Excited, Inspired, Afraid, Guilty.

Several different timeframes have been used with the PANAS. The current study timeframe adopted was 'during the past week'. Reliability and Validity reported by Watson (1988) was moderately good. For the Positive Affect Scale, the Cronbach alpha coefficient was .86 to .90; for the Negative Affect Scale, .84 to .87. Over an 8-week period, the test-retest correlations were .47 - .68 for the PA and .39 - .71 for the NA. The PANAS has strong reported validity with such measures as general distress and dysfunction, depression, and state anxiety (Crawford & Henry, 2005). The mean value of Cronbach's α in the current study were Positive Affect Scale = .88 and Negative Affect Scale = .89.

Cognitive Emotion Regulation Questionnaire (Garnefski, Kraaij & Spinhoven, 2001). The CERQ assesses ways individuals cognitively cope with negative life events. The CERQ consists of 36 items that assess how often certain cognitive strategies are employed to cope with stressful life events. Participants respond on a five-point Likert scale ranging from 1 = almost never to 5 = almost always. The scale measures nine cognitive emotion regulation strategies including positive re-appraisal, acceptance, self-blame, positive refocusing, refocus on planning, putting into perspective, rumination, catastrophising and blaming others (Garnefski et al., 2001). Consistent with previous research (Garland et al., 2011), the positive-reappraisal subscale of the CERQ was used to measure positive re-appraisal. The positive reappraisal subscale includes items such as "I think I can learn something from the situation," and "I think I can become a stronger person as a result of what happened." Higher scores indicate higher engagement in positive re-appraisal as a cognitive coping strategy. Previous research has demonstrated the CERQ to have good internal consistency, with a Cronbach's Alpha = .85 (Garland et al., 2011). Adequate convergent validity has also been demonstrated with subscales of the Symptom Checklist - 90 (Garnefski et al; Garnefski and Kraaij 2007). The mean value of Cronbach's α in the current study was .94.

Additional Outcome Measures

Perceived Stress Scale (Cohen, Kamarck & Mermelstein, 1983). The PSS is a 10-item self-report questionnaire that assesses the extent to which an individual appraises life events as stressful within the last week (Cohen et al., 1983; Lavoie & Douglas, 2012). The scale has been developed for use in community samples and has been normed on 3000 adults from the general population in North America and is recommended for use in individuals with

a minimum secondary school level education (Lavoie & Douglas, 2012). The PSS is utilised internationally as the most widely used psychological instrument for measuring perceptions of stress (Lavoie, & Douglas, 2012). Participants respond to items on a 5-point Likert scale ranging from 0 = never to 5 = very often. Example of items include, "In the last week, how often have you felt nervous and stressed?" and "How often have you felt you were on top of things?" A total perceived stress score is obtained ranging from a low of 0 to a theoretical high of 40. Higher scores indicate higher levels of perceived stress. Sound psychometric properties have been demonstrated for the measure, including high reliability (Cronbach's alpha = .93) and validity of the PSS (Kalaldeh & Shosha, 2012). The mean value of Cronbach's α in the current study was .87.

The Depression Anxiety Stress Scale (Lovibond & Lovibond, 1995). The DASS-21 is a 21-item self-report questionnaire that assesses symptoms related to the negative emotional states of depression, anxiety, and stress in both clinical and non-clinical populations aged 12 years and over (Lovibond & Lovibond, 1995). Each item uses a 4-point Likert response format ranging from 0 = (Did not apply to me at all) to 3 = (Applied to me very much or most of the time). Scores range from 0 to 21 for each subscale, with higher scores indicating higher symptomology and five categories relating to severity, ranging from normal to extremely severe (Lovibond & Lovibond, 1995). In addition to being used to measure these three domains, there is emerging evidence that the total score of the DASS-21 (DASS-T) can be used as a reliable and valid measure of overall psychological distress in different populations, including young people (Evans et al., 2022). This thesis also combined the DASS-21 subscale scores to produce a total score representing psychological distress.

The depression scale contains seven items designed to assess inertia, dysphoria, devaluation of life, hopelessness, self-deprecation, and anhedonia. Sample subscale items include "I couldn't seem to experience any positive feeling at all." The anxiety scale contains even items designed to measure autonomic arousal, anxious affect, situational anxiety and skeletal muscle effects. Sample subscale items include, "I was worried about situations in which I might panic and make a fool of myself." The stress scale examines chronic levels of arousal related to stress. Participants are required to answer each item on the scales in terms of how often it has applied to them over the previous week. Sample subscale items include, "I find it hard to wind down."

Research has established the DASS-21 as a reliable and valid measure of depressive, anxiety and stress symptoms (Coker et al., 2018). A study conducted by Kia-Keating et al

(2017) examined the validity of the DASS-21 as an effective screening tool with EA undergraduate students. Results supported use of the DASS-21 as part of an efficient universal monitoring assessment of college students' mental health and well-being. As a robust measure of general distress with strong psychometric properties, the researchers recommended the DASS-21 as an effective and brief assessment of mental health in university counselling centres, health clinics and, with growing attention to empirically assessing quality of care, to monitor the effects of campus wellness programs (Sinclair et al., 2012).

Construct validity has also been established with confirmatory factor modelling revealing the hypothesised three factors structure was an optimal fit to the model, demonstrating the DASS-21 is comprised of the psychological constructs of depression, anxiety and stress (Sinclair et al., 2012). The mean value of Cronbach's α in the current study was .90.

The Resilience Scale (Wagnild & Young, 1993; Wagnild, 2009). The RS was developed to evaluate the levels of resilience in the general population. Its reduced version (RS-14) has presented reliable internal consistency and external validity (Wagnild, 2009). The RS measures the degree of individual resilience, with the author's describing the scale as a potential measure of internal resources and of the positive contribution of what one brings to a difficult life event (Wagnild & Young, 1993). The RS-14 is a self-rating scale that measures individual resilience in any setting. The scale items are scored on a 7-point scale from 1 = (strongly disagree), to 7 = (strongly agree). The RS measures five core domains of resilience, including equanimity, perseverance, self-reliance, meaningfulness, and existential aloneness. Sample items include, "my belief in myself gets me through hard times" and ""my life has meaning."

Psychometric evaluation supports the internal consistency reliability and concurrent validity of the scale (Wagnild & Young, 1993). Assessment of psychometric properties of the RS showed Cronbach's alpha coefficients between .89 and .92 across different ethnic samples (Damsao, 2011, Wagnild, 2009, Pritzker & Minter, 2014). In a systematic review of resilience measurement scales that included specific measures applied to adolescents (Windle et al., 2011) criticisms were raised to some of the measures, including the RS, in respect to the fact that the adolescents target group was not involved with the item selection. Some authors recommend more rigorous approaches to content validity (Streiner & Norman, 2008).

Despite this criticism, the RS obtained one of the highest scores on overall quality, content validity, construct validity and overall internal consistency and interpretability with younger populations (Windle et al., 2011). The RS was the first instrument developed to study

resilience and one of the most used in research (Pinheiro & Matos, 2012). Both versions, long (RS with 25 items) and short (RS-14 with 14 items), of the instrument have been applied to a wide variety of age groups and have been translated into other languages (Japanese, Swedish, Nigerian, Spanish, Russian and Portuguese).

Convergent validity was demonstrated by significant positive correlations between the two measures of resilience (RS and RS-14) and flourishing and divergent validity was demonstrated by significant negative correlations with anxiety and depressive symptoms. The higher associations were obtained between resilience and flourishing and depression. Wagnild and Young (1993) also demonstrated the convergent and divergent validity of RS-14 with life satisfaction and depressive symptoms. The RS was therefore determined to be an appropriate instrument to use for the study of resilience in an EA population due to the psychometric properties of the instrument and its applications in a variety of settings and populations. The mean value of Cronbach's α in the current study was .91.

The Satisfaction with Academic Experience Subscale (Nora, 2004). The 5-item SAES forms part of the larger Survey of Student Attitudes and Behaviours Influencing College Choice (Nora, 2004). The subscale is a measure of student satisfaction with academic experience, and assesses satisfaction with classroom experiences, interactions with staff and preparation for the future based on personal expectations (Nora, 2004). Students are asked to rate the degree to which they agree or disagree with statements that reflect their level of satisfaction with their academic experience (e.g., My classes are appropriately challenging). Items were scored on a 5-point Likert Scale from 1 = strongly disagree, to 5 = strongly agree. Scores on the SAES range from 5 to 25, with higher scores indicating higher satisfaction with academic experience. The SAES has demonstrated sound psychometric properties, with Cronbach's alpha coefficients, ranging from .77 to .82 (Nora). Additionally, the has demonstrated adequate construct and content validity. The SAES has been found to predict student persistence or departure from university (Nora). The mean value of Cronbach's α in the current study was .81.

Salivary Cortisol Collection

Salivary cortisol is an established biomarker for hypothalamus–pituitary–adrenal (HPA) axis functioning, one of the two major stress axes in the body (Hellhammer, et al., 2009). Salivary cortisol assays are conventionally used in series, 4-hours apart, to determine a subject's diurnal cortisol rhythm. This rhythm provides a spectrum of information about a

subject's general level of function, including sleep quality, mood, typical daily energy levels, and the balance of neurotransmitters and hormones.

In contrast, a spot cortisol assay taken before and after intervention provides a snapshot of the immediate stress-reduction effects of therapy. For this reason, salivary cortisol has been advocated as an objective biomarker of the efficacy of psychotherapy (Hellhammer et al., 2009). One study stated that the findings suggested salivary cortisol represents an objective neuroendocrine marker for changes in anxiety and distress observed during relaxation training (Cruess et al., 2000). The reliability of the relationship between cortisol levels and mental health treatment has led to several studies using cortisol biomarkers (Gaab et al., 2003; Kellner et al., 2002; Olff et al., 2007; Stapleton et al., 2020).

Spot cortisol assay samples were collected from the Intervention group at pre, post and one-month follow-up data points. Samples were also collected at the same time points for the Waitlist-Control Group (i.e., pre, post and one-month follow-up). At the commencement of the study participants were provided with Instructions regarding the collection (see Appendix I). Saliva was collected using a 5-cm section of a plastic straw and a 2-mL microtube from Stratech (Sydney, Australia). When providing a sample, participants were asked to swallow and then accumulate the saliva in their mouths for 2 min and then release their saliva through the straw into the microtube. In the current study, salivary cortisol was measured using The Salimetrics® High Sensitivity Cortisol Enzyme Immunoassay Kit (Salimetrics).

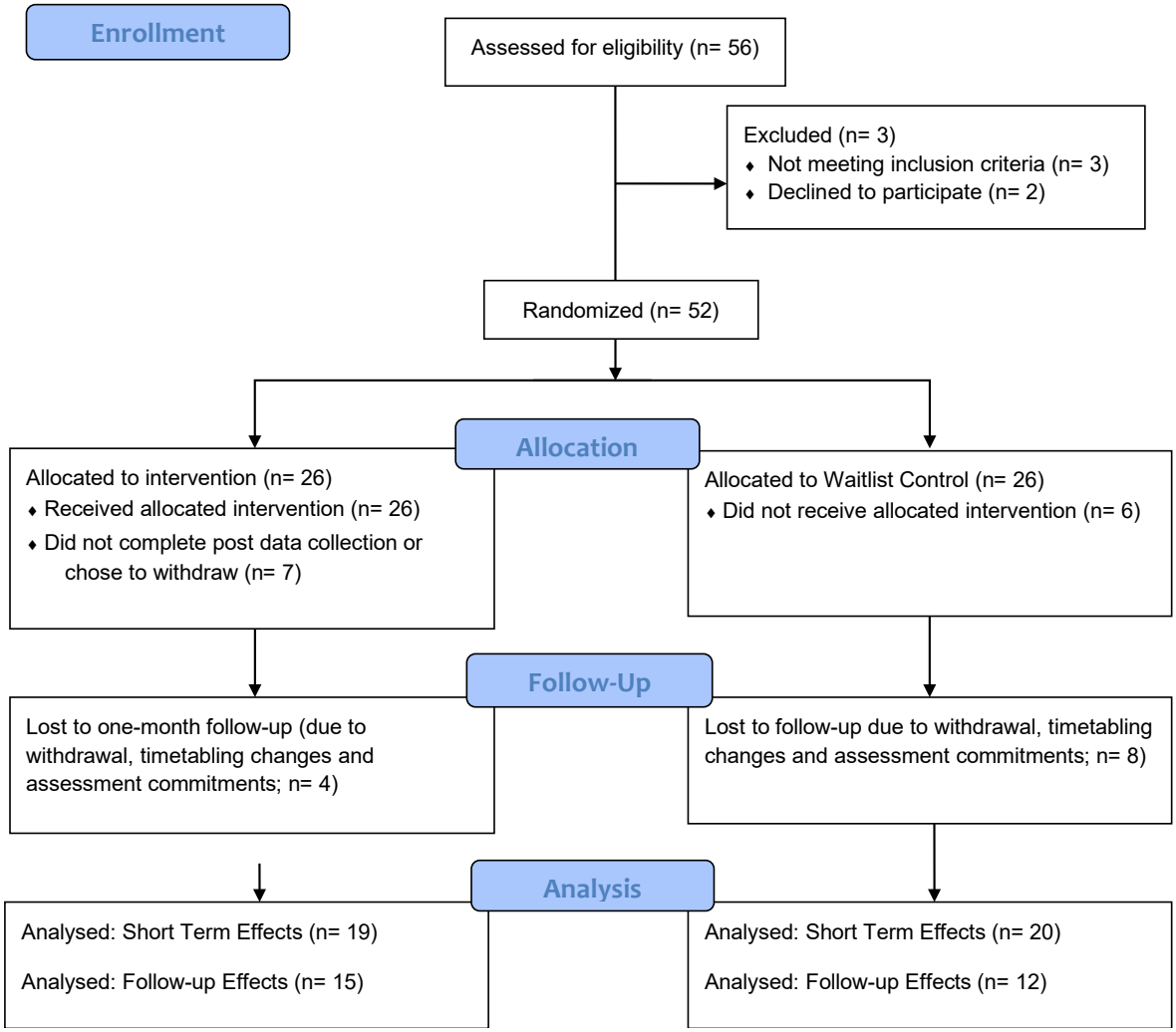
Participant saliva samples were coded by number to ensure blind analysis by the researcher. A strict set of recommendations was provided by the manufacturer and communicated with research participants. This included requiring participants to do the following: a) avoid alcohol 12 hours before providing a sample, b) refrain from consuming food one hour prior to saliva collection, c) avoid dairy products 20 minutes prior to collection, d) avoid food high in sugar, acidity or caffeine and e) participants were asked to rinse their mouth with water and wait at least 10 minutes after rinsing and before collecting saliva 30 minutes prior to and after the intervention groups.

Phases of the Randomised Control Trial

Figure 11 below shows a flow diagram based on the 2010 CONSORT Flow Diagram guidelines of the progress through the phases of the randomised trial of the Intervention and Waitlist-Control Group from screening, intervention allocation, follow-up, and data analysis.

Figure 11

Phases of the Randomised Control Trial of the Intervention and Waitlist-Control Groups from Screening, Intervention Allocation, Follow up, and Data Analysis.



Statistical Methods: Part A

The primary endpoint was change in participants' levels of mindfulness, psychological flexibility, self-compassion, positive emotions, and positive re-appraisal. Changes in resilience, psychological distress, and perceived stress among EA medical students from pre to post pilot 6-week MARST-P, and at one-month follow-up were also examined. A secondary efficacy endpoint was the significance of spot cortisol assays taken pre, post and one-month following the MARST-P intervention.

The present study employed a between subjects' design, including one independent variable (IV) and eight dependent variables (DV). Following the randomisation process, an IV with two levels: the Intervention Group and the Waitlist-Control Group. The DVs for the study were mindfulness, psychological flexibility, self-compassion, positive emotions and positive re-appraisal. Resilience, psychological distress and perceived stress were also examined. To ascertain group differences, the Intervention Group and the Waitlist-Control Group were measured on each DV at baseline, post intervention and at one-month follow-up. The study also utilised a correlational design to examine the relationship between changes in the DVs post and one month following the MARST-P. Means and standard deviations were used to summarise cortisol levels across time points time points (i.e., baseline, post-intervention and one-month follow-up) for the Intervention Group and the Waitlist-Control Group. Two different approaches were used to compare the cortisol levels:

To assess differences between groups on scores on the DV's over time, One-Way Repeated Measures Multivariate Analysis of Variance (MANOVA) was used to assess whether there was a statistically significant difference in the multivariate means between the Intervention Group and the Waitlist-Control Group. MANOVA was chosen instead of using separate Analysis of Variance (ANOVA) to reduce the Type 1 error rate. The null hypothesis H0 of a one-way MANOVA is that the multivariate means of all groups are equal i.e., the means are equal across groups for each response variable

$$\mu 1=\mu 2=...=\mu\ k.$$

Pearson correlations was used to assess the correlation between various dependent variables to ensure that the DVs included are correlated with each other and to ensure the absence of multicollinearity ($r > .9$). The MVN package in R studio was used to assess the assumption of multivariate normality. Hypothesis testing for MANOVA was performed at the 5% margin of error. Plots were generated using R v 3.6.

Power Analysis

Post-hoc power analysis was performed to assess the power of the study to detect the observed difference at a significance level 0.05 with the sample size included in the study (Levine & Ensom, 2001). Such approach is justified since the results showed that there was a statistically significant difference between the Intervention Group and the Waitlist-Control Group post-intervention and at follow up. Power analysis was performed to assess whether

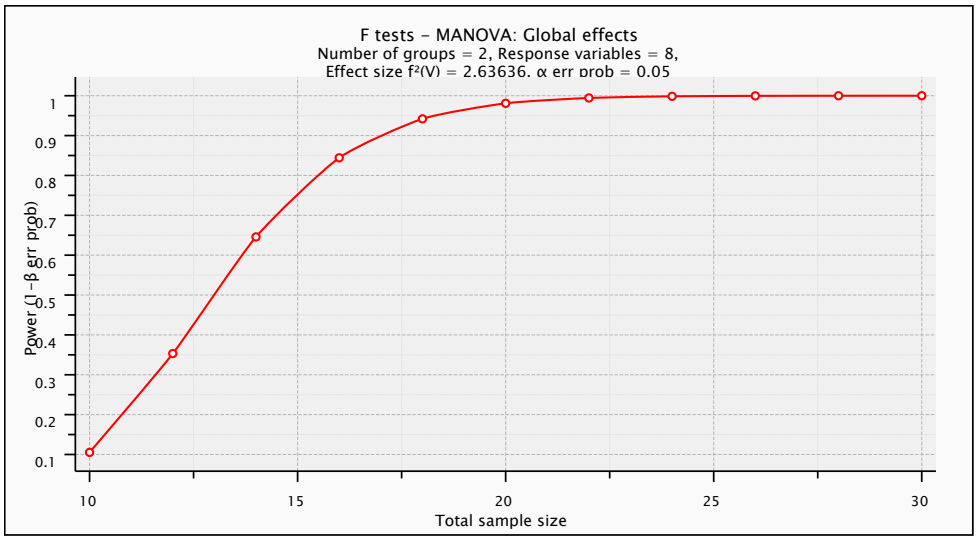
the number of participants included was sufficient to detect the observed effect size with sufficient power (80%) at a significance level (α) .05.

The effect size (f2 V) was calculated based on Pillai's trace V post-intervention and at follow up. Post-intervention, the observed effect size (f2 V) was 2.6 (large effect size) which was calculated based on MANOVA's results pot-intervention (Pillai's trace V = 0.73). At follow up, the observed effect size (f2 V) was 5.58 (large effect size) which was calculated based on MANOVA's results at follow-up (Pillai's trace V = 0.85). A significance level of .05 was used, and 27 participants were included in the current study.

G-power was used for post-hoc calculation of power based on the above-mentioned criteria. Based on the abovementioned parameters, the study had a 99.8% power to detect the observed effect size (f2 V 2.6) post-intervention at α .05. The study also had a 100% power to detect the observed effect size (f2 V 2.6) at follow up at α .05. This is higher compared to the required power of 80% used in literature (Ryan, 2013). This result is consistent with other recommendations when using MANOVA, where more cases than DVs in every cell is needed (Tabachnick & Fidell, 2007). MANOVA is also robust to violations of multivariate normality if there is not a large difference in group size or cell size (i.e., n of the largest group or cell is no more than 1.5 times the n of the smallest group; Leech et al., 2005). Thus, the cell size for the current study was considered acceptable.

Figure 12

Power Analysis Post-Intervention

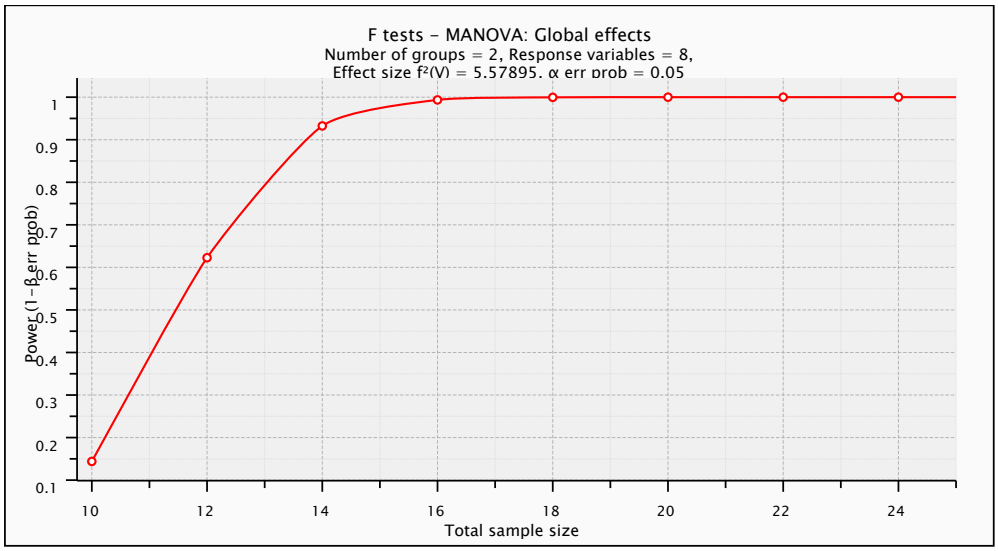


Note: Figure 12 also shows that a total sample of 16 participants (8 per group) was needed to detect the observed effect post-intervention with an 80% power at a significance level .05.

Figure 13 also shows that a total sample of 14 participants (7 per group) was needed to detect the observed effect at follow up with an 80% power.

Figure 13

Power Analysis at Follow-up



Note. Thus, sample size included in the current study (n = 27) was sufficient based on the above-mentioned calculation. Only 16 participants are considered sufficient to detect the effect sizes observed in the current study with 80% power at a significance level .05.

Statistical Methods: Part B

A secondary efficacy endpoint was the significance of spot cortisol assays taken pre, post and one-month following the MARST intervention. Statistical analysis to assess cortisol via spot saliva assay across three time points (baseline, post-intervention and one-month follow-up) was performed using SPSS v 24. Means and standard deviations were used to summarize cortisol levels across time points time points for the Intervention Group and the Waitlist-Control Group. Two different approaches were used to compare the cortisol levels:

1- The difference in cortisol levels (i.e., between baseline and post-interventions, and baseline and one-month follow up) was compared between both groups using unpaired t-test. Unpaired t-test was used since the dependent variable (difference in cortisol levels) is a continuous normally distributed variable. The independent variable is a categorical variable with only two levels which makes unpaired t-test a suitable option for the analysis.

2- The % change in cortisol level post-intervention and at one-month follow up was also compared between both groups using unpaired t-test.

$$\%\ change\ at\ post-intervention = \frac{baseline - post\ intervention}{baseline} \times 100$$

$$\%\ change\ at\ on-month\ follow\ up = \frac{baseline - follow\ up}{baseline} \times 100$$

Two-tailed hypothesis testing was performed. Statistical analysis was performed at 5% margin of error. P values less than .05 were considered statistically significant.

Sample Preparation and Analysis Process Overview

Below is a summary of the process utilized by the Stratech Laboratory to analyze the saliva samples. Samples were stored frozen at -20°C until assay. All samples underwent one freeze thaw cycle. On the day of assay analyses an appropriate number of samples were thawed and analysed using commercially available kits (Salimetrics, USA) according to the manufacturer's instructions. Thawed samples were centrifuged at 1500 x *g* for 15 min to collect clear saliva and this saliva was used without further processing for all assays. All samples were brought to room temperature before adding to the assay wells and all samples were analysed in duplicate.

By measuring the concentration of Ab/hrpF we can measure the amount of salivary cortisol (sF) present in the subject saliva. Salivary cortisol was measured in duplicate by an enzyme immunoassay kit (Salimetrics, 1–3002) with a sensitivity of 0.003 g/dl and a reference range of 0.012–3.000g/dl and analysed following the manufacturer's recommendations at an absorbance of 450/490 nm. The Salimetrics cortisol assay kit is a competitive immunoassay specifically designed to measure salivary cortisol. It uses a specific monoclonal antibody to competitively bind endogenous salivary cortisol (sF) and a specified concentration of added horseradish peroxidase labelled cortisol (hrpF). The degree of competition between endogenous and added cortisol can be calculated to measure salivary cortisol. The reaction can be summed as follows:

$$Ab + sF + hrpF \Rightarrow Ab/sF + Ab/hrpF$$

Participant saliva samples were coded by number to ensure blind analysis by the researcher employed for this aspect. In the current study, salivary cortisol was measured in duplicate using The Salimetrics® High Sensitivity Cortisol Enzyme Immunoassay Kit (Salimetrics). All assays were noted to run well with excellent reproducibility.

Results

Part A: Multivariate Analysis of Variance

Assumptions

Multivariate Analysis of Variance (MANOVA) assumptions were tested prior to the analysis to ensure the validity of the results and correct for any violations in the assumptions. MANOVA is robust to violations of multivariate normality if there is not a large difference in group size or cell size (i.e., n of the largest group or cell is no more than 1.5 times the n of the smallest group (Leech et al., 2005). Moreover, MANOVA assumes the normality of the residuals rather than the normality of the dependent variables. Thus, MANOVA can be used even if the dependent variables are not normally distributed if the distribution of the residuals is normal.

Violations can be accounted for during the analysis phase e.g., rejecting the null hypothesis for the homogeneity of covariance matrices can be accounted for by using Pillai's trace instead of Wilk's lambda (Field, 2009). Seven main assumptions were examined prior to performing the MANOVA. Each of these assumptions was evaluated for each of the three time points (baseline, post-test, and follow-up). Below is a summary of the assumptions assessed.

1. Continuous one or more dependent variable

The dependent variables should be continuous (measured at the interval or ratio scale)

2. Categorical independent variable

The independent variable should be categorical (two or more independent groups)

3. Independence of observations

There should be independence of observations and no relation between various observations or groups

4. Adequate sample size

To determine adequate sample size for MANOVA, the number of cases in each cell (or combination of groups) should be higher than the number of the DVs (Tabachnick & Fidell, 2007).

5. Multivariate normality

Multivariate normality was evaluated using the MVN package in R which supports several statistics to assess the multivariate normality as well as the univariate normality for each of the dependent variables. The Mardia statistic was used to assess the multivariate normality of the DVs. Shapiro-Wilk test and histograms were used to assess the univariate normality for

each of the DVs. A 5% margin of error was used to assess the significance of Shapiro-Wilk test ($\alpha = .05$).

6. Homogeneity of variance-covariance matrices

This can be evaluated using the Box's M test of equality of covariance. If sample sizes are equal, MANOVA is robust to violations in the Box's M test. If samples sizes are unequal, a 0.1% margin of error will be used during the hypothesis testing ($p < .001$ was considered statistically significant). If Box's M test was deemed statistically significant, Pillai's trace rather than Wilk's lambda will be used to assess the significance of the results since it is robust to the violations of the assumption of homogeneity of variance-covariance matrices.

7. Absence of multicollinearity

Variables should be moderately correlated with each other, and the correlation should not exceed 0.9 between any pair of DVs being examined.

Results of Assumption Testing

Assumptions 1 and 2 were met as all dependent variables were continuous in nature and the independent variable (group) is a categorical variable with two levels (MARST vs Control). Independence of observations was also met as the study participants across the three time points was (n = 27) were randomly selected and there was no relation between observations or groups. The participants were allocated to either the Waitlist-Control Group (n = 12) or the Intervention Group (n = 15). Eight dependent variables were used. Thus, the sample size in the smallest cell (Waitlist-Control Group, n = 12) is greater than the number of dependent variables which means that adequate sample size is achieved.

Multivariate Normality

The assumption of multivariate normality was met at baseline and post-intervention time points. However, this assumption was violated at follow-up time point for the Intervention Group (see Table 33). Univariate normality was also assessed although multivariate normality is more important when performing MANOVA. Results of univariate normality are not needed unless the results of multivariate normality indicated a violation of such assumption.

Table 33

Multivariate Normality Analysis Results for the Intervention and Waitlist-Control Groups

		Test	Statistic	P	Result
Baseline	Intervention	Mardia Skewness	112.62	0.67	Yes
		Mardia Kurtosis	-1.68	0.09	Yes
		Overall			Yes
	Waitlist-Control	Mardia Skewness	127.57	0.3	Yes
		Mardia Kurtosis	-1.47	0.14	Yes
		Overall			Yes
Post-intervention	Intervention	Mardia Skewness	144.73	0.06	Yes
		Mardia Kurtosis	-0.99	0.32	Yes
		Overall			Yes
	Waitlist-Control	Mardia Skewness	135.28	0.16	Yes
		Mardia Kurtosis	-1.23	0.22	Yes
		Overall			Yes
One-month follow-up intervention	Intervention	Mardia Skewness	168.01	< 0.001*	No
		Mardia Kurtosis	-0.78	0.44	Yes
		Overall			No
	Waitlist-Control	Mardia Skewness	130.85	0.23	Yes
		Mardia Kurtosis	-1.56	0.12	Yes
		Overall			Yes

The Mardia skewness for the Intervention Group was statistically significant (skewness = 168, $p < .001$), meaning the overall assumption of multivariate normality at the follow-up time point for the Intervention Group was not met. However as previously mentioned, MANOVA is robust to violations in multivariate normality.

At baseline or pre-intervention, only psychological distress for the Intervention Group did not meet the assumption of univariate normality (statistic = .87, $p = 0.036$). The assumption was met for all remaining dependent variables across the two groups. Table 34 shows results for univariate normality at baseline measurement.

Table 34

Shapiro-Wilk Test for Univariate Normality for Baseline Data

Group	Variable	Statistic	p value	Normality Met
MARST	Psychological Distress	0.87	0.0355	No
	Mindfulness	0.97	0.916	Yes
	Positive Emotions	0.92	0.173	Yes
	Perceived Stress	0.92	0.192	Yes
	Positive Reappraisal	0.89	0.061	Yes
	Psychological Inflexibility	0.95	0.562	Yes
	Resilience	0.92	0.195	Yes
	Self-compassion	0.96	0.631	Yes
Control	Psychological Distress	0.98	0.957	Yes
	Mindfulness	0.97	0.911	Yes
	Positive Emotions	0.91	0.240	Yes
	Perceived Stress	0.91	0.236	Yes
	Positive Reappraisal	0.93	0.338	Yes
	Psychological Inflexibility	0.89	0.113	Yes
	Resilience	0.91	0.211	Yes
	Self-compassion	0.87	0.057	Yes

At post intervention, the assumption of univariate normality was violated for mindfulness (test statistic = .74, $p < .001$) and positive reappraisal (test statistic = 0.86, $p = .025$) in the Intervention Group. The assumption was also violated for positive reappraisal and psychological inflexibility in the Waitlist-Control Group ($p = .003$ and .007, respectively). The remaining variables met the assumption for univariate normality. Table 35 below shows results for univariate normality for both groups at post-intervention measurement.

Table 35

Shapiro-Wilk Test for Univariate Normality for Post-Intervention Data

Group	Variable	Statistic	p value	Normality Met
MARST	Psychological Distress	0.90	0.097	Yes
	Mindfulness	0.74	0.001	No
	Positive Emotions	0.92	0.166	Yes
	Perceived Stress	0.95	0.597	Yes
	Positive Reappraisal	0.86	0.025	No
	Psychological Inflexibility	0.96	0.710	Yes
	Resilience	0.94	0.331	Yes
	Self-compassion	0.81	0.005	No
Control	Psychological Distress	0.89	0.129	Yes
	Mindfulness	0.90	0.167	Yes
	Positive Emotions	0.92	0.293	Yes
	Perceived Stress	0.90	0.161	Yes
	Positive Reappraisal	0.75	0.003	No
	Psychological Inflexibility	0.79	0.007	No
	Resilience	0.96	0.835	Yes
	Self-compassion	0.88	0.097	Yes

At one-month follow-up intervention, many of the variables did not meet the assumption of univariate normality when Shapiro-Wilk test was used. The null hypothesis was rejected for psychological distress (statistic = .82, p = .008), positive emotions (statistic = .77, p = .002), positive reappraisal (statistic = .74, p = .001) and resilience (statistic = .74, p < .001) in the Intervention Group. The null hypothesis was also rejected for the positive emotions, perceived stress, positive reappraisal, psychological inflexibility, resilience, and self-compassion in the Waitlist-Control Group. Table 36 below shows results for univariate normality for both groups at one-month follow- up intervention measurement.

Table 36

Shapiro-Wilk Test for Univariate Normality for One-Month Follow-Up Data

Group	Variable	Statistic	p value	Normality
MARST	Psychological Distress	0.82	0.008	No
	Mindfulness	0.91	0.121	Yes
	Positive Emotions	0.77	0.002	No
	Perceived Stress	0.89	0.074	Yes
	Positive Reappraisal	0.74	0.001	No
	Psychological Inflexibility	0.92	0.217	Yes
	Resilience	0.74	0.001	No
	Self-compassion	0.91	0.131	Yes
Control	Psychological Distress	0.92	0.323	Yes
	Mindfulness	0.89	0.104	Yes
	Positive Emotions	0.80	0.010	No
	Perceived Stress	0.84	0.024	No
	Positive Reappraisal	0.71	0.001	No
	Psychological Inflexibility	0.77	0.005	No
	Resilience	0.78	0.005	No
	Self-compassion	0.74	0.002	No

Homogeneity of Covariance Matrices

Results of this assumption test showed at baseline, Box's M test was not statistically significant at the 0.1% margin of error ($\alpha = .001$) which indicates homogeneity of covariance matrices at baseline (Box's M = 63.22, p = .285). However, Box's M test was statistically significant post-intervention (Box's M = 114.24, $p < .001$) and at follow up (Box's M = 122.13, $p < .001$). Thus, Pillai's trace will be used to assess the significance of the main effect of the group (control vs. MARST) since it is robust to violations in the assumption of the homogeneity of variance-covariance matrices. Table 37 shows results for Box's Test of equality of covariance matrices across the three-time measurement points.

Table 37

Box's Test of Equality of Covariance Matrices

	Pre-intervention	Post-intervention	One-month Follow-up
Box's M	63.22	114.24	122.13
F	1.12	2.03	2.17
df1	36	36	36
df2	1876.66	1876.66	1876.66
P	.285	< .001	< .001

Note: Tests the null hypothesis that the observed covariance matrices of the dependent variables are equal across groups.

Absence of Multicollinearity

Results showed correlation between the dependent variables was statistically significant at 0.01 level. The strength of Pearson's correlation varied from .44 to .84. None of the correlations was greater than .9 and all variables were moderately or highly correlated which fulfills the assumption for the MANOVA. Table 38 shows the correlations between dependent variables.

Table 38

Correlations Between Dependent Variables

	Psychological Distress	Mindfulness	Positive Emotions	Perceived Stress	Positive Reappraisal	Psychological Inflexibility	Resilience
Psychological Distress							
Mindfulness	-.671**						
Positive Emotions	-.547**	.572**					
Perceived Stress	.751**	-.831**	-.741**				
Positive Reappraisal	-.673**	.678**	.610**	-.749**			
Psychological Inflexibility	.787**	-.809**	-.464**	.791**	-.587**		
Resilience	-.685**	.821**	.682**	-.843**	.840**	-.688**	
Self-compassion	-.724**	.825**	.495**	-.818**	.687**	-.774**	.778**

***. Pearson's correlation is significant at the 0.01 level (2-tailed).*

Descriptive Statistics

Results showed similar results across dependent variables for both groups at baseline measurement. Figure 14 below shows the change in mean values for the Intervention and Waitlist-Control Groups for each dependent variables across the three-time measurement points. The mean values for mindfulness, positive emotions, positive reappraisal, psychological inflexibility, resilience and self-compassion increased post-intervention in the Intervention Group compared to the Waitlist-Control Group, which showed no increase and even showed a slight decline over time. This observed difference in the means between the Intervention and Waitlist-Control Groups was sustained or even increased at one-month follow up, indicating a beneficial effect for the six-session MARST-P.

An opposite trend was observed between the two groups for psychological distress, perceived stress and psychological inflexibility. The mean values for these three constructs were lower in the Intervention Group compared to the Waitlist-Control Group at the post-intervention and one-month follow up time points. With regards to psychological inflexibility, this result suggests that the Intervention Group showed higher mean scores in *psychological flexibility* at post intervention and one-month follow-up measurement. Table 39 below shows the descriptive statistics for the study sample.

Figure 14

Change in mean values for Intervention and Waitlist-Control Group across Three Time Measurement Points (pre = pre-intervention; post = post-intervention; FU = one-month follow-up intervention).

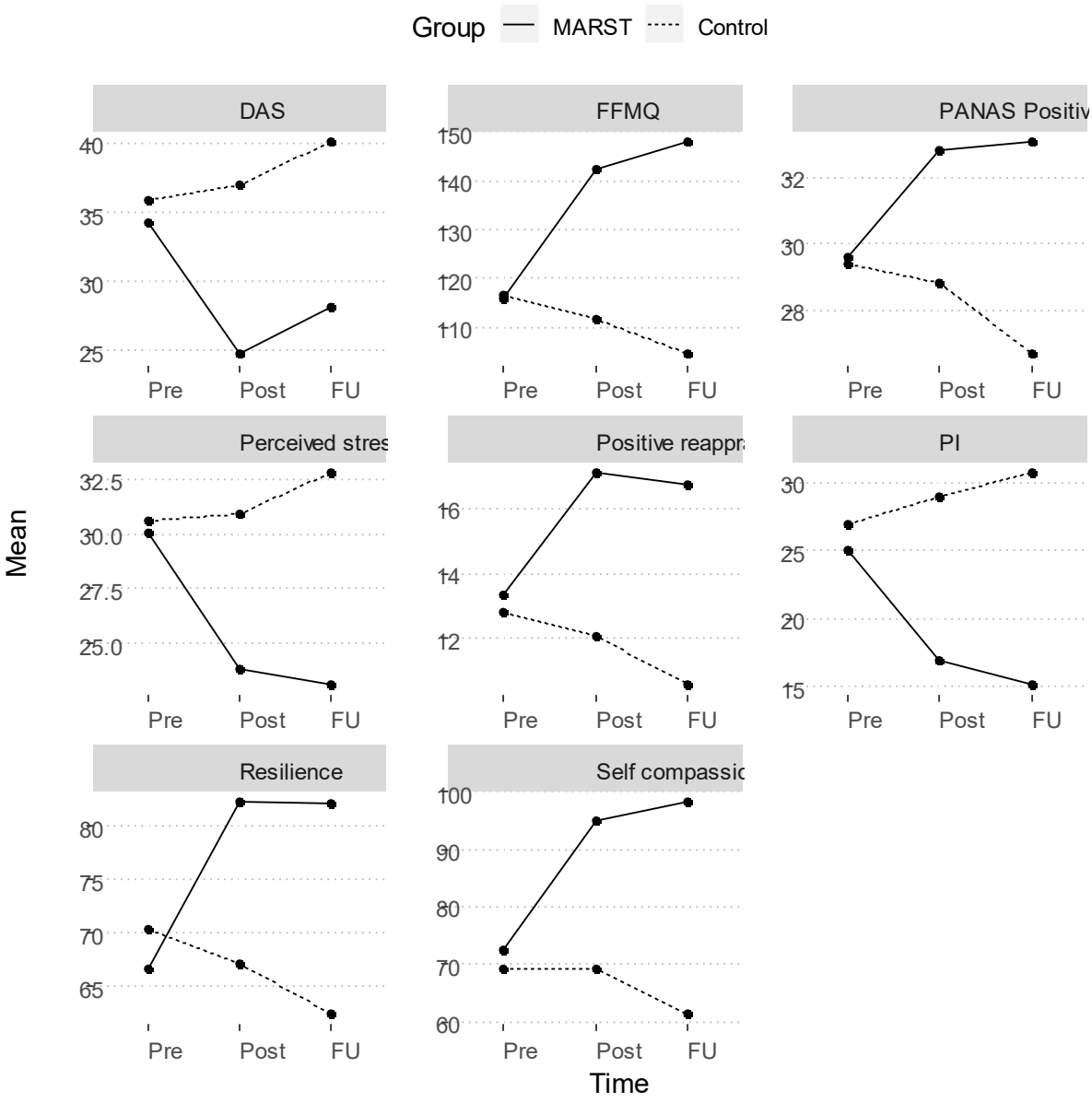


Table 39

Descriptive Statistics for the Study Sample (n = 27)

	Pre-intervention				Post-intervention				One-month Follow-up			
	Control		MARST		Control		MARST		Control		MARST	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Psychological Distress	35.92	6.40	34.27	8.00	37.00	7.52	24.73	2.63	40.08	7.95	28.13	5.48
Mindfulness	116.75	15.74	115.93	22.18	111.67	11.71	142.53	26.12	104.42	10.62	147.93	18.61
Positive Emotions	29.42	4.98	29.60	10.46	28.83	6.37	32.80	5.76	26.67	5.05	33.07	9.66
Perceived Stress	30.58	4.36	30.07	7.09	30.92	5.00	23.87	4.96	32.83	3.33	23.13	6.63
Positive Reappraisal	12.83	4.65	13.33	4.78	12.08	5.21	17.13	2.85	10.58	4.46	16.73	4.48
Psychological Inflexibility	26.92	5.02	25.07	9.06	28.92	5.60	16.93	5.87	30.75	5.17	15.20	5.14
Resilience	70.33	11.2	66.73	16.51	67.17	11.74	82.33	10.29	62.42	9.04	82.20	12.30
Self-compassion	69.25	16.1	72.60	14.85	69.33	17.57	94.87	13.97	61.33	18.75	98.27	15.45

Main Analysis of Treatment Effects: Multivariate Analysis of Variance

Below in Table 40 is a summary of the multivariate analysis of variance (MANOVA) results for group cross the three time points measured.

Table 40

Multivariate Analysis of Variance Results

Time	Pillai's trace	F	Hypothesis df	Error df	p	ηp^2	Observed Power
Baseline/pre-intervention	.24	.690	8.00	18.00	.70	.24	.23
Post-intervention	.73	5.92	8.00	18.00	.001*	.73	.99
One-month Follow up	.85	12.52	8.00	18.00	< 0.001*	.852	1

Note: Pillai's trace was used to assess the significance of the results ηp^2: Partial eta-squared

Preliminary Multivariate Analysis of Variance

A preliminary MANOVA was conducted to assess for statistically significant differences between the Intervention and Waitlist-Control Groups across the dependent variables at baseline measurement. Using Pillai's Trace, the results did not show a statistically significant multivariate main effect of Group $F(8, 18) = .69$, $p = .70$. This indicates that the null hypothesis can be accepted with regards to equality of multivariate means between both groups. That is, the means for all dependent variables were equal between groups pre-

intervention. As the initial MANOVA was not statistically significant no post-hoc analysis was therefore conducted.

Short Term Treatment Effects: Multivariate Analysis of Variance

A Two-Way Repeated Measures MANOVA was used to test whether there was a significant effect of the MARST program at post measurement between groups for the dependent variables. Post-intervention, Pillai's trace for the main effect of group was statistically significant $F(8, 18) = 5.92$, $p = .001$). This means that we can reject the null hypothesis of equality of multivariate means between both groups. The effect size ($\eta p^2 = .73$) showed that this effect explained 73% of the variance in scores. Power to detect the effect was .99 which is considered adequate (> .8). Given the significance of the overall test, the univariate main effects were therefore examined.

Univariate Analysis

Significant univariate main effects for group were obtained for four of the variables that showed an increase in the Intervention Group; mindfulness, $F(1, 25) = 14.36$, $p = .001$, $\eta p^2 = .37$, power = .95; resilience, $F(1, 25) = 12.79$, $p = .001$, $\eta p^2 = .34$, power = .93 ; positive re-appraisal, $F(1, 25) = 10.3$, $p < .05$, $\eta p^2 = .292$, power = .87; and self-compassion, $F(1, 25) = 17.74$, $p < .001$, $\eta p^2 = .42$, power = .98. This indicates that the observed means for these four variables which showed an increase in the Intervention Group post-intervention were significantly higher than the observed means in the Waitlist-Control Group. Only positive emotions did not show a statistically significant difference between groups $F(1, 25) = 2.88$, $p = .10$, $\eta p^2 = .10$, power = .37.

Similarly, the univariate main effects were statistically significant for psychological inflexibility, $F(1, 25) = 28.91$, $p < .001$, $\eta p^2 = .54$, power = .99; psychological distress, $F(1, 25) = 34.88$, $p < .001$, $\eta p^2 = .58$, power = 1; and perceived stress, $F(1, 25) = 13.39$, $p = .001$, $\eta p^2 = .35$, power = .94. This indicates that the observed means for these three variables in the Intervention Group post-intervention were significantly lower compared to the observed means in the Waitlist-Control Group. With regards to psychological inflexibility, these results suggest that compared to the Waitlist-Control, the Intervention Group showed significantly higher *psychological flexibility* post intervention. Table 41 displays the univariate analysis between groups results at post-intervention.

Table 41

Univariate Analysis Results (One-way ANOVA)

	Type III SS	df	Mean Square	F	Sig.	ηp^2	Observed Power
Mindfulness	6351.67	1	6351.67	14.36	.001	.37	.954
Resilience	1533.52	1	1533.52	12.79	.001	.34	.930
Psychological Inflexibility	957.34	1	957.34	28.91	< 0.001	.54	.999
Perceived Stress	331.35	1	331.35	13.39	.001	.35	.940
Positive Emotions	104.90	1	104.90	2.88	.102	.10	.372
Self-compassion	4346.34	1	4346.34	17.74	< 0.001	.42	.981
Psychological Distress	1003.14	1	1003.14	34.88	< 0.001	.58	1.000
Positive reappraisal	170.02	1	170.02	10.30	.004	.29	.869

Follow-up Treatment Effects: Multivariate Analysis of Variance

A Two-Way Repeated Measures MANOVA was used to test whether there was a significant effect of the MARST program at one-month follow-up measurement between groups for the dependent variables. At one-month follow-up Pillai's trace for the main effect of group was statistically significant $F(8, 18) = 12.52$, $p < .001$). This means that we can reject the null hypothesis of equality of multivariate means between both groups. The effect size ($\eta p^2 = .85$) showed this effect explained 85% of the variance in scores. Power to detect such effect was 1 which is considered adequate (> .8). Given the significance of the overall test, univariate main effects were examined at one-month follow-up.

Univariate Analysis

Significant univariate main effects for group were obtained for all dependent variables that showed an increase in the Intervention Group; mindfulness, $F(1, 25) = 51.84$, $p < .001$, $\eta p^2 = .675$, power = 1; resilience, $F(1, 25) = 21.63$, $p < .001$, $\eta p^2 = .46$, power = .99 ; positive re-appraisal, $F(1, 25) = 12.61$, $p < .05$, $\eta p^2 = .34$, power = .93; positive emotions, $F(1, 25) = 4.3$, $p < .05$, $\eta p^2 = .15$, power = .51; and self-compassion, $F(1, 25) = 31.54$, $p < .001$, $\eta p^2 = .56$, power = 1. These results indicate that compared to the Waitlist-Control Group, the observed means for the Intervention Group were significantly higher across these variables at one-month follow-up.

Similarly, the univariate main effects were statistically significant for psychological inflexibility, $F(1, 25) = 60.63$, $p < .001$, $\eta p^2 = .71$, power = 1; psychological distress, $F(1, 25) = 21.35$, $p < .001$, $\eta p^2 = .46$, power = .99; and perceived stress, $F(1, 25) = 21.27$, $p < .001$, $\eta p^2 = .46$, power = .99. These results indicate that compared to the Waitlist-Control Group, the

observed means for the Intervention Group were significantly lower across these variables at one-month follow-up. With regards to psychological inflexibility, these results suggest that compared to the Waitlist-Control, the Intervention Group continued to show significantly higher *psychological flexibility* at one-month following intervention. Table 42 shows the univariate analysis between groups results for one-month follow-up.

Table 42

Univariate Analysis Results (One-way ANOVA)

	Type III SS	df	Mean Square	F	Sig.	ηp^2	Observed Power
Mindfulness	12624.67	1	12624.67	51.84	.000	.68	1.000
Psychological Distress	952.02	1	952.02	21.35	.000	.46	.99
Resilience	2609.20	1	2609.20	21.63	.000	.46	.99
Psychological Inflexibility	1612.02	1	1612.02	60.63	.000	.71	1.00
Perceived stress	627.27	1	627.27	21.27	.000	.46	.99
Positive Emotions	273.07	1	273.07	4.30	.049	.15	.51
Self-compassion	9093.81	1	9093.81	31.54	.000	.56	1.00
Positive reappraisal	252.15	1	252.15	12.61	.002	.34	.93

Part C: Cortisol Analysis

To examine differences between the Intervention and Waitlist-Control Group in the spot cortisol assay taken at baseline, post and one-month follow-up intervention unpaired t-test was used. The % change in cortisol level post-intervention and at one-month follow up was also compared between both groups using unpaired t-test. Two-tailed hypothesis testing was performed. Statistical analysis was performed at 5% margin of error. P values less than .05 were considered statistically significant.

Descriptive Statistics

Figure 15 below shows the mean cortisol level for the Intervention and Waitlist-Control group across each time measurement point. Table 43 below presents the descriptive statistics for the study sample.

Figure 15

Changes in Cortisol Levels with Time

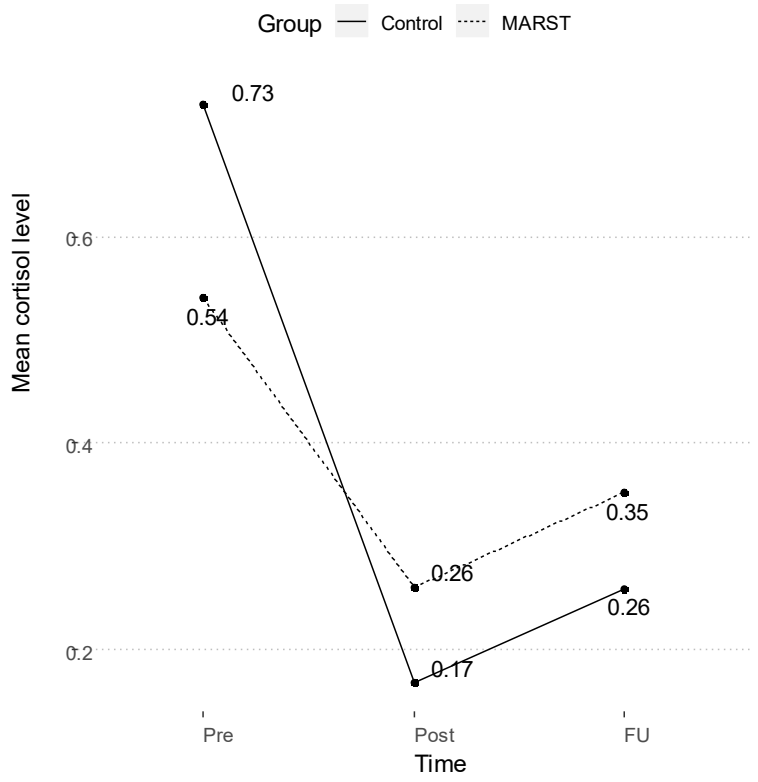


Table 43

Descriptive Statistics for the Study Sample

Time		Group	N	Mean	Std. Deviation
Pre	cortisol	Control	10	.73	.34
		MARST	16	.59	.28
Post	cortisol	Control	9	.17	.14
		MARST	11	.26	.17
One-month	cortisol	Control	8	.26	.13
Follow-up		MARST	7	.35	.18

Change in Cortisol from Baseline

Table 44 below shows the mean change in cortisol for both groups at post-intervention and one-month follow-up. Table 45 shows the cortisol difference from baseline between groups at post-intervention and one-month follow-up. Results show that the change from baseline was not significantly different between the Intervention and Waitlist-Control Groups at post-intervention $t(18) = 0.97$, $p = .35$) or at follow-up $t(13) = 1.80$, $p = .10$). This indicates that the change from baseline was not significantly different between both groups.

Table 44

Difference from Baseline in Both Groups

Time	Group	N	Mean change	SD
Post	Control	9	.52	.37
	MARST	11	.39	.26
One-month Follow-up	Control	8	.53	.37
	MARST	7	.23	.25

Table 45

Comparing Cortisol Difference from Baseline Across Groups

Time	t	df	P	d	SE	Lowe 95% CI	Upper 95% CI
Post	.97	18	.35	.13	.14	-.16	.43
One-month Follow-up	1.80	13	.10	.30	.17	-.06	.66

d: Difference in the mean change from baseline

Calculating Percentage Change from Baseline

Results show that the percentage change in cortisol from baseline was not significantly different between the Intervention and Waitlist-Control Groups at post-intervention $t(18) = .91$, $p = .38$) or at one-month follow-up $t(13) = 1.36$, $p = .20$). This indicates that the % change from baseline was not significantly different between both groups at either post-intervention or at one-month follow up.

Table 46

Percentage Change from Baseline in Both Groups

Time	Group	N	Mean change	SD
Post	Control	9	69.86	35.89
	MARST	11	57.81	23.23
One-month Follow-up	Control	8	60.26	29.59
	MARST	7	33.63	45.72

Table 47

Comparing Difference from Baseline Across Groups

	t	df	P	d	SE	Lowe 95% CI	Upper 95% CI
Post	.91	18	.38	12.05	13.28	-15.84	39.94
One-month Follow-up	1.36	13	.20	26.63	19.61	-15.74	69.00

d: Difference in the mean % change from baseline

Discussion

The purpose of the current study was to extend the literature and empirical research pertaining to MBIs with EAs engaged in university education. Specifically considering the environmental and developmental challenges associated with this stage of life, and the unique additional stressors faced by EA university students engaged in medical training, the Study 3 focused on understanding and evaluating the efficacy of a pilot MBI with this population. This study aimed to evaluate the pilot six-session MARST-P with an EA medical student population from Bond University, Australia. Furthermore, this study aimed to assess the pilot MARST-P capacity to target essential resources for EA university students established within the MEI which was proposed in Chapter 4 and evaluated within Study 2. Support for the MEI efficacy provides a guiding framework for the development of MBI's targeting successful adaptation for EA university students.

When considering the increasing rates of significant stress and mental health concerns experienced by EA university students, particularly those engaged in degrees such as medicine, the current research is essential and imperative to better understanding the complex nature of promoting resilience and adaption within this population. Furthermore, whilst comprehensive systematic reviews and meta-analyses show evidence for the efficacy of MBI's in improvement of symptoms of common mental disorders, such as depression or anxiety, systematic reviews of MBI's for university students show preliminary evidence for effectiveness. However, the evidence is inconsistent and mostly from non-randomised evaluations or evaluations or other methodological and reporting issues and does not focus on an EA population alone.

The current study attempted to address some of these limitations and was developed via consultation and feedback with students and university staff, providing an example of inclusive research informing student welfare policy. This study also provides insight into the nature of effective practice frameworks and evidence for preventative MBI's as acceptable and feasible for students and universities, as essential components of a wider student mental health strategy for EA university students within developed regions.

Study 3 was divided into two sections, with hypotheses pertaining to Part A directly relating to the expansion of Study 2. Specifically, this section examined the efficacy of the pilot six-session MARST -P in targeting essential components within the MEI as well as overall resilience. This section also examined the effectiveness of the pilot six-session MARST-P in reducing perceived stress and psychological distress. Part B examined

differences between the Intervention and Waitlist-Control Group in the spot cortisol assay taken at baseline, post and one-month follow-up intervention. A discussion of each section follows below.

Part A Hypotheses one, which predicted that compared to the Waitlist-Control Group, the Intervention Group would report significantly higher mindfulness, psychological flexibility, positive-reappraisal, self-compassion, positive emotions, and resilience from pre to post intervention and at one-month follow-up intervention was partially supported. Results showed that the mean post-intervention scores for mindfulness, self-compassion, positive re-appraisal and resilience were significantly higher in the Intervention Group compared to the Waitlist-Control Group. Post intervention, mean scores for psychological inflexibility were significantly lower in the Intervention Group compared to the Waitlist-Control Group, suggesting that those who participated in the MARST-P showed higher *psychological flexibility* than those in the Waitlist-Control Group. Only positive emotions were non-significant post intervention between the two groups. As predicted, these results were consistent at one-month follow-up however, mean follow-up scores for positive emotions were also significantly higher in the Intervention Group compared to the Waitlist-Control Group. This result provides support for the effectiveness of this pilot version of the MARST - P in targeting factors identified within the MEI and resilience.

This result also provides further support for the expanding nature of these resources over time and is consistent with Fredrickson's (1998) Broaden and Build Theory which suggests the experience of positive emotions momentarily broadens the scope of an individual's attention and thinking. This broadened outlook, or widened perspective, leads to the development of personal resources, such as resilience. Focusing on testing specific meditation to increase self-compassion and compassion for others (i.e., Loving Kindness Meditation) Fredrickson and colleagues (2008) tested the build component of this theory by attempting to ascertain whether the experience of positive emotions led to an increase in personal resources. Results showed consistent with the broaden and build theory, the LKM intervention led to increases in a range of positive emotions, which were in turn related to increases in a variety of personal resources, including resilience and mindfulness. Overall, these results suggest that the experience of positive emotions may take time to cultivate within an EA university population, however once experienced continue to contribute to the increasing and expanding nature and interplay between the adaptive components and resources within the MEI. These results also provide preliminary support for the pilot six-

session MARST-P as an effective intervention with this population in targeting these factors.

Part A Hypotheses two, which predicted that compared to the waitlist control group, the Intervention Group would report significantly lower perceived stress and psychological distress from pre to post intervention, and these results would be maintained at one-month follow-up MARST intervention was supported. These results are consistent with previous research into the effectiveness of MBI's in reducing stress and psychological distress (e.g., Kakosche et al., 2021; Richards & Martin, 2012; Totzeck et al., 2020). However, to the author's knowledge a model such as the MEI has not been utilised as a guiding intervention framework with an EA medical student population from Australia. The results of this study provide support for both the MEI and the pilot six-session MARST -P as potentially preventative student mental health strategy for young medical students.

These results provide further support for the MEI as a guiding framework for the development of MBI's with EA university students, and highlights interventions designed to target resilience with an EA university student population, including at-risk populations such as those studying medicine, should include strategies to target positive re-appraisal, via aspects identified in the MEI. Overall, these results provide strong evidence for the MEI as a guiding model for interventions with EA university students and provides preliminary evidence for the efficacy of the six-session pilot MARST-P with an at-risk EA university student population at fostering positive re-appraisal and resilience.

Part C Hypotheses one, which predicted that compared to the Waitlist-Control Group, the Intervention Group will report significantly lower spot cortisol assay at post and one-month follow-up intervention was not supported. Results showed that the change from baseline was not significantly different between the Intervention and Waitlist-Control Groups at post and one-month follow-up intervention. Similarly, the percentage change from baseline was not significantly different between groups at post and one-month follow-up.

Limitations and Future Research

Several limitations are noted with the current study. Firstly, self-report methods and social desirability biases present as limitations and future research should incorporate the collection of collateral data and measurement of social desirability. Another limitation of the study was that no measure of treatment fidelity was included. Future studies could include a measure of treatment fidelity to assess the reliability of the administration of the intervention. Future research could also include the comparison of two interventions or incorporate an active-control group to assess group differences and intervention outcomes.

Furthermore, whilst spot cortisol assay was taken within the current study to examine physiological changes to cortisol hormone as a result of the intervention, future studies could enhance this collection method. Specifically, recent studies documented salivary alpha‐amylase as a reliable surrogate marker of the sympathetic nervous system, the other major stress axis in the body (Kirschbaum & Hellhammer, 2007). The cortisol awakening response (CAR) is part of the daily profile and has been demonstrated to be associated with psychosocial variables and perceived chronic stress and well‐being (Hellhammer et al., 2007). Taken together, salivary cortisol and alpha‐amylase daily profiles provide insight into physiological functioning under basal non‐stressful conditions. Future research could adopt the established collection protocol by Hellhammer (2007), where saliva is sampled to examine the cortisol awakening profile as well as to explore the daily cortisol profile using eight saliva samples collected over two consecutive days, with the first sample was taken in bed upon awakening, then 15 minutes later, 30 minutes later and 45 minutes after awakening, then at 9, 13, 17 and 21 hours. Furthermore, external factors such as sleep cycles and duration, nicotine, medication and vigorous exercise prior to collection were not controlled for and may have impact the results. Future studies could replicate with larger samples and control for these confounding variables.

These results are also somewhat consistent with previous suggesting that the use of salivary cortisol as a reliable test of cortisol is somewhat conflicting. At present, several salivary biomarkers such as salivary cortisol are currently being used in stress research (Crnković et al., 2018). Salivary biomarkers are more popular in stress-related research because it is easy and non-invasive to obtain and has been proven to be better than testing biomarkers from the blood (Yia & Moochhalab, 2013). Some researchers suggest that changes in salivary and serum cortisol levels are an effective biomarker indicating a reduction in stress following treatment programs such as MBIs (Matousek et al., 2009).

However, a meta-analysis conducted by Sanada et al., (2016) showed a significant moderately low effect for improving the state of health, based on cortisol levels, resulting from MBIs in healthy populations. One included trial (Jensen et al., 2012) showed significant effects of MBIs on the levels of salivary cortisol, whilst another trial (Rosenkranz et al., 2013) showed only marginal effects. These two trials used standardised measures of cortisol. In contrast, the other trials included in the meta-analysis, which used raw cortisol data (Klatt et al., 2009; Oken et al., 2010; Flook et al., 2013), showed no significant efficacy of the MBIs. In Study 3, this outcome may be the result of using a young and healthy population of medical

students. This may also suggest that when measuring physiological changes following MBI's, salivary cortisol may not be the most appropriate measure. Future research may consider collecting blood samples or using other physiological measures of stress in conjunction with self-report measures.

Furthermore, whilst sample size was clearly established as adequate for the evaluation of a pilot program, future research could replicate the study using larger samples to provide greater efficacy and generalisability of the results. Additionally, whilst EA medical students studying in Australia were examined only, future studies could examine the efficacy and effectiveness of the six-session MARST-P with EA medical students or the general university population from other regions. The results of this study suggest the generalisability of the program within an Australian sample. However, the results of Study 1 showed significant differences between EA university students from different regions (e.g., Hong Kong) in terms of resilience. Therefore, the program may need to be adapted to better target resilience and psychological well-being in these populations.

Future studies could also look at comparing intervention effectiveness between EA students in urban and rural areas of Australia as well as examine the effectiveness of the program in targeting outcomes between domestic and international students studying in the same region. This would allow for further revision of the program specific to group need.

Finally, whilst this body of research has focused on EA university students, future research could also assess both applicability of the MEI and the six-session MARST-P with EA university students (i.e., those aged 18-29) compared to those university students aged 30 years and older. This would also allow for the development and revision of preventative mental health initiatives for all university students. Such research would begin expanding beyond the EA, to provide greater understanding and support of how to promote EI across the lifespan.

Conclusion

Building on Study 1 and 2, the results of Study 3 addresses important research gaps regarding the process of promoting resilience and psychological well-being in EA university students, including at-risk groups such as medical students. The results of this study also provide further support for the MEI as a guiding framework for the development of effective MBIs with this population. Overall, this study provides preliminary evidence for the effectiveness and efficacy of the pilot six-session MARST -P at targeting elements identified within the MEI within an EA medical student population. Results showed the pilot six-session

MARST-P targeted all variables within the MEI, with those participants in the Intervention Group showing significantly higher mindfulness, psychological flexibility, self-compassion, positive emotions, positive re-appraisal and resilience at one-month follow-up. The intervention was also successful at lowering perceived stress and psychological distress both at post and one-month follow-up intervention.

These results assist to expand on Study 2, which explored the role and facets of mindfulness in promoting resources within the MEI. Specifically, these results serve to highlight that effective MBIs with EA university students designed to target resilience and psychological well-being include elements that aim to foster and positive reappraisal. Overall, these results are unique and provide a solid framework and effective intervention with this population.

CHAPTER SEVEN

GENERAL DISCUSSION

Chapter Overview

This thesis presented three sequential studies that were carried out with the overarching aim of better understanding vulnerabilities to psychological distress during EA and improve evidence-based frameworks and intervention for enhancing resilience and well-being via mindfulness-based approaches in those young people transitioning to university. This final chapter begins by summarising the key findings from these studies, with reference to the objectives stated in Chapter 1. The clinical implications of this research are then discussed. Lastly, the main strengths and limitations of the research project are considered, with suggestions for future research provided.

Summary of Findings

As noted in Chapter 1, the current study had three main research questions, which were addressed sequentially in the current thesis. To contextualise this chapter, these research questions are re-stated below:

1. What are the mental health concerns of EA university students studying in different regions around the world? (Chapter 1 and 2)
    1.1 How is resilience conceptualised in relation to these populations?
    1.2 What is the role of resilience in the prevention of psychological distress among EA university students from different regions engaged in higher education institutions?
2. Can a more comprehensive definition of resilience be provided relevant to this population? (Chapter 3 and 4)
    2.1 What mechanisms underpin resilience in EAs?
    2.2 Can a comprehensive mindfulness-based model be developed and validated in an Australian sample?
    2.3 In addition to increasing resilience and psychological well-being, can this model promote EA university student's capacity to positively re-appraise life events as benign or of benefit?
3. What strategies, frameworks and interventions promote mind-body resilience in EA university students?
    3.1 Can the newly developed model inform the development of a MBI? (Chapter 5 and 6)

3.1 Can the efficacy of this MBI be assessed with EA medical students in Australia (i.e., a sub-group at elevated risk of stress and psychological distress)?

Understanding Psychological Distress and Resilience in Emerging Adults in Different Regions

To clarify understanding of the mental health concerns and the role of resilience in EA university students studying in different regions around the world, Chapter 1 and 2 reviewed mental health concerns and conceptualisations of resilience with application to the EA university student from Australia, USA and Hong Kong.. Study 1 investigated the role of resilience in the prevention of perceived stress, psychological distress (i.e., anxiety, depression and stress) and perceptions of satisfaction with the university experience among EA university students from these regions (i.e., Australia, Hong Kong and Florida - USA). Chapter 2, Study 1 recruited (N = 221) EA university students aged 18 to 29 years from Bond University (Australia), the University of Florida (USA), and the University of Hong Kong (Hong Kong). Examining these facets in EAs from these regions was chosen to identify similarities in resilience, perceived stress, psychological distress and SAE to better understand how social and societal context impacts these aspects pertaining to well-being.

Specifically, this study investigated how differing levels of resilience (i.e., very low to very high) were associated with psychological distress, perceived stress, and SAE in EAs studying in these three regions: Australia, Hong Kong and USA. Secondly, this study investigated how perceived stress impacted psychological distress via analysing the mediating and moderating effect of resilience and SAE.

Overall, differences in mental health were observed within the sample among students studying in these different regions. Specifically, participants in Australia generally reported significantly lower DASS-21 scores (particularly lower depression scores) as well as lower perceived stress, whilst students in USA reported significantly less DASS-21 stress symptoms compared to those in other regions. Students from Hong Kong generally reported higher DASS-21 anxiety scores and perceived stress scores compared to other regions. Young students from Hong Kong also reported significantly lower levels of resilience and SAE within this sample, with students from Australia and Florida (USA) reporting similar resilience scores. These results have been discussed in detail in Chapter 2.

Whilst significant differences in mean scores were observed among these variables, region was not observed to make a significant contribution in subsequent moderation or mediation analyses. However, these differences highlight the importance of understanding the unique

developmental, social/political, and cultural contexts relevant to EA university student when understanding how to improve both resilience and psychological well-being. Further specific consideration and investigation may be useful in understanding the interplay between social, political, and cultural factors as well as developmental relevant tasks that impact EA university student mental health and resilience, shaping their launch from family of origin and transition to university.

Overall, the results showed that EA students with higher resilience also experienced lower levels of psychological distress and perceived stress, and higher satisfaction with academic experience independent of region. Overall, students with lower resilience also reported higher perceived stress and higher psychological distress (i.e., depression, anxiety and stress scores). Significant relationships between perceived stress and psychological distress were also partially mediated by a student's resilience level, providing further support for the relationship between with lower resilience and higher levels of psychological distress.

Moderation analyses indicated resilience scores moderated only the relationship between perceived stress and the DASS-21 stress subscale, with moderate to higher values of resilience resulting in decreased DASS-21 stress scores when perceived stress was a predictor. Importantly however, these results suggest that EA university students with moderate and high resilience levels showed a reduction in reported DASS-21 stress symptoms even when their perceived stress was reported to be high. These finding suggest even though an event or experience may be *perceived* as stressful (e.g., thoughts about the capacity to cope with academic workload, financial stress, or peer relationships), resilience skills reduced the self-reported psychological and physiological symptoms of stress experienced by that individual, and therefore the impact of that stress. This suggests that for those EAs with higher resilience, this ability and resource may act to protect both mental health and physical well-being during this developmental phase even if they perceive this to be a stressful time.

Chapter 2 also highlighted the most effective way to comprehensively understand resilience is to study this construct within specific developmental periods (Rutter, 2007; Plocha & Bacigalupe, 2020). Generally, definitions of resilience focus on the capacity to "bounce back" in response to such adversity and/or perceived stressful circumstances in a timely way such that psychophysiological resources are conserved (Haase et al., 2016; Resnick et al., 2011; Tugade & Fredrickson, 2004; Whitson et al., 2016). However, there remains limited consensus regarding what facets underpin resilience within this population.

A review of the literature regarding EAs highlights a fundamental need for researchers to more comprehensively examine and define resiliency factors. Definitions and conceptualisations must consider the neuroscience of EA, as well as the unique stressors, developmental tasks and systemic considerations associated with this life stage, and how this combines to create a window of vulnerability to both psychological distress and growth potential relevant to this stage of life.

This study also highlighted the need to not only examine resilience with respect to developmental stage, but also consider the unique cultural considerations associated with this transition. In Australia national data is not regularly collected or monitored on experiences of mental ill-health (either diagnosed or not) among university students and there is a paucity of Australian based research into this population (The National Centre of Excellence in Youth Mental Health, 2017). Subsequent studies in the present research aimed to address these gaps by examining resilience specific to an EA population within Australian university settings.

Development of a New Conceptualisation of Resilience with Emerging Adults: Eudaimonic Integration

To address the limitations of existing definitions and conceptualisations of resilience in relation to EA populations, Chapter 3 reviewed population relevant literature and proposed a novel and expanded perspective on resilience. Specifically, this research proposed the term EI, as a more comprehensive definition of resilience, with potential application across the lifespan. EI is summarised below.

EI proposes that the process of fostering adaptive self-regulation, meaning making and wisdom during and following adversity involves integrated neurobiology and balanced, adaptive components of mind and body considered within the context of relational systems (Brown, 2012; Seigel, 2012;). This is where the individual is moving towards a differentiated sense of self within social spheres (Bowen, 1978; Skowron et al., 2009). For most human beings, stress and adversity is predominantly intertwined with relationships (or perceived lack of). This can include events that occur with partners, family, friendships, colleagues, acquaintances and within community and society at large (Brown, 2012). Through the development of EI an individual moves towards greater integrated neurobiology. This occurs via enhancing their capacity to navigate stressors and relationships with increasing self-awareness and regulation, psychological flexibility, adaptive meaning making and self-differentiation. This individual understands how to remain healthily connected and confidently autonomous during times of adversity.

This new concept further extends systemic theories by proposing the quality and balance within relationships with others is not the only relationship salient to a resilient stress response. Moving towards an accepting and compassionate self-relationship is proposed as a critical foundation during EA in enhancing integration of mind and body and self-differentiation. This research contends that self-compassion is an essential component of maintaining self- regulation, psychological flexibility and beneficial meaning making throughout life to flourish and reach individual potential.

This research proposes that EI fluctuates across time and is an ongoing process of cultivation requiring effort and commitment to create and sustain. However, it is also proposed that over time and despite these variations, with consistent practice, EI can continuously expand for individuals. Specifically, this suggests that whilst EI is a transitory state, when reinforced through practice over time, it may develop into trait or dispositional EI.

Overall, this new concept proposes that through an evolving process of active integration and self-differentiation, the capacity for adaptive self-awareness and regulation, self-compassion, flexible perspective taking and therefore beneficial meaning making are possible across the lifespan. It is proposed that these elements naturally lead to greater experiences of positive emotions, psychological well-being, and adaptive stress response. For the EA, fostering integration and balance within the mind-body and relationships (both self and others), is particularly salient as they move towards self- differentiation and the establishment of emerging and adult identities.

The opportunity for continued growth and maturity in life and relationships is inevitably linked to exposure to stressors and adversity (Brown, 2012; Seigel, 2010), particularly with others. These interactions and events provide the opportunity to learn to respond with intentionality and flexibility, gain insight and understanding, and cultivate compassion to move forward with enhanced resources. The new theory of EI contends that resilience and well-being is founded on the quality, flexibility and health of relationship with self, others and the world across the lifespan; and our capacity to bring awareness to and make beneficial meaning of events within these relationships. This is turn facilitates growth and integration in the face of commonly shared challenges associated with being a human being. This concept embodies the notion that it is not just how we can assist individuals to handle stress better, but rather how can we assist them to flourish and reach their potential in ever increasing ways as they face the inevitable challenges associated with being human.

Evaluation of the Model of Eudaimonic Integration with Emerging Adult University Students

Chapters 3 and 4 aimed to identify relevant mechanisms underpinning resilience within an EA university population and thus develop and evaluate a mindfulness-based model with EA university students in Australian. Study 1 (Chapter 2) results highlighted the role of resilience in the prevention of psychological distress and stress among EA university students from different globalised regions. Chapter 3 also proposed an expanded definition of resilience, introducing the concept of EI and outlined the role of mindfulness meditation in cultivating resilience, introducing important underlying constructs associated with both resilience and the capacity for positive re-appraisal. Chapter 3 also highlighted research gaps pertaining to the development of validated mindfulness-based models of resilience within EA population, particularly within Australia.

To address these gaps, Study 2 (Chapter 4) proposed and evaluated a new theoretical model of resilience for an EA university population, the MEI. The MEI was evaluated with the aim of providing a guiding framework for the development of a pilot MBI, the MARST-P with an Australian sample of EA student. A brief overview of the MEI is provided below.

The Model of Eudaimonic Integration

The MEI (see Figure 16 below) was proposed as a longitudinal process model of mindful emotion regulation (both positive and negative) and quality and integration of relational systems (with self, others and world), promoting response flexibility, positive emotion regulation and compassion as a foundation for beneficial meaning making of life events and challenges. This, in turn, fosters eudaimonic resilience, growth and personal potential across the lifespan. Depending on the application of the model to a specific population, the unique developmental tasks and impending/current life-cycle transition are also considered to provide guidance around the nature and context of specific stressors to inform the development of appropriate interventions.

The MEI describes the process of increasingly embodying adaptive psychosomatic practices and resources during present-moment experience, including moments of adversity. Specifically, these facets include increased self-awareness and regulation, psychological flexibility, positive emotions with a compassionate self-relationship as key. Cultivated through mindfulness, these components are proposed to underpin resilience and foster the capacity for positive re-appraisal. This research contends these facets form the foundation for healthy, integrated neurobiology and balanced, adaptive components of mind and body

considered within the context of relational systems. That is, the individual (e.g., EA) is moving towards a differentiated and mature sense of self within social spheres.

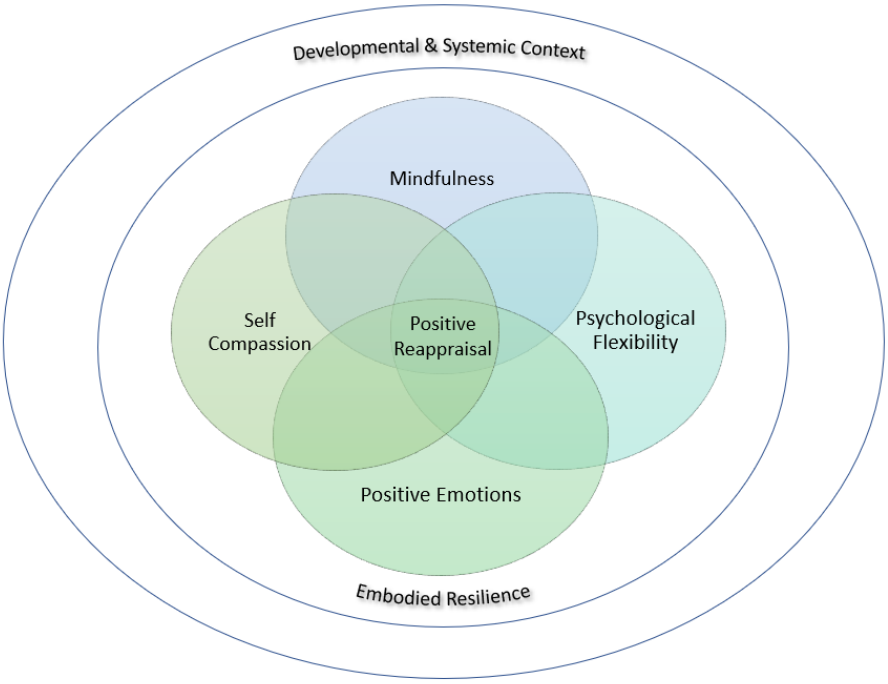
Through healthy, integrated neurobiology the EA can navigate launching from home and transition to university with resiliency skills that foster self-differentiation; remaining healthily connected to others and confidently autonomous during times of adversity (Brown, 2012; Seigel, 2010;). This research further expands systemic theories by proposing the quality and balance within relationships with others is not the only relationship salient to both resilience and self-differentiation. Moving towards an accepting and compassionate self-relationship is proposed as a critical foundation during EA for fostering embodied resilience, especially when engaged in university studies.

Overall, through an evolving process of EI and increasing self-differentiation, the capacity for adaptive self-awareness and regulation, self-compassion, flexible perspective taking and therefore beneficial meaning making are possible across the lifespan. It is proposed that these elements naturally lead to greater experience of sustained positive emotions, psychological well-being and adaptive stress response. Optimising present moment processing is also proposed that embodied resiliency skills enable greater capacity for caring for and releasing negative thoughts and emotions from the body as they arise, promoting empowerment, authenticity, and acceptance of experience in every now-moment. This promotes the capacity to bring awareness to and make beneficial meaning of events within these events and relationships. Overall, this program of research was not just about helping young people to cope with stress better, rather it aimed to support them to stay connected to the present moment and embody their authentic self to empower and nurture adaptive meaning making and development in ever expanding ways.

The MEI proposes an integrated systems view of how mindfulness promotes resilience, fosters response flexibility, promotes positive emotion and self-compassion as foundations for personal beneficial meaning making of life events and challenges. The model describes a comprehensive and interwoven relationship between these facets which over time operate in conjunction to foster expanding levels of embodied resilience and psychosomatic processing of present moment experience within the individual, impacting the inter-connected systems which surround them.

Figure 16

Model of Eudaimonic Integration



Note. A graphical depiction of the MEI. A longitudinal process model of mindful emotion regulation (both positive and negative) and quality and integration of relational systems (with self, others and world), promoting response flexibility, positive emotion regulation and compassion as a foundation for beneficial meaning making of life events and challenges, which in turn, fosters eudaimonic resilience, growth and personal potential during EA.

Model of Eudaimonic Integration – Theoretical Foundation

Mindfulness to Meaning Theory (Garland et al., 2015)

Mindsight/Eight Domains of Integration (Seigel, 2012)

Broaden and Build Theory (Fredrickson, 2001)

Bowen Family Systems Theory (Bowen, 1978)

Relational Frame Theory (Hayes et al., 2006)

Appraisal and Coping Model During Transition to University (Dvorakova et al., (2018)

Table 48 below provides an overview of the key processes associated with the four phases of the MEI. Please see p 130 for a detailed explanation of each phase.

Table 48

Overview of the Four Phases of the Model of Eudaimonic Integration

MEI Phase	Summary of Key Processes
First Phase	• Facilitating metacognitive and non-judgemental attunement to present moment experience (i.e., thoughts, feelings, sensations) • Decentering from stress appraisals and increased self-regulation • Disengagement from self-referential processing to promote increased psychological and response flexibility
Second Phase	• Increased mindful metacognition and psychological flexibility, increased capacity for self-regulation, positive emotions and positive re-appraisal • These qualities or aspects in turn enhance the capacity to relate to and hold self, others and the world with greater compassion
Third Phase	• These components are interwoven, and engagement enhances positive re-appraisal capacity over time • Components include, metacognitive awareness, self-regulation, psychologically flexible perspective taking and response, increased capacity for positive emotions and positive attunement to experience and compassionate relational skills • This ongoing process embodies resilience and supports young people to move towards successful self-differentiation
Fourth Phase	• The ongoing, reciprocal and expanding nature of these components and inner resources embody EI • Via committed and ongoing mindfulness meditation practice, these aspects transform into trait levels of each component • This process of fostering EI provides a guiding framework for achieving mind-body homeostasis during and following events, and supporting young people's potential and growth

Study 2 was conducted to evaluate the MEI with an EA university population aged 18 to 29 years studying in Australia (n=420). The evaluation of the MEI provided evidence for a new mindfulness-based resiliency model to support reductions in rates of stress and psychological distress identified for the EA university student in an Australian context, as well as provide a framework to guide and inform MBIs with this population. This study explored both conceptually and empirically, the strength of direct causal relationships and associations between variables within the model.

This study is unique in that a path model of this nature has not been previously tested, and limited research has examined these variables within this population. This study evaluated the MEI by examining the process via which mindfulness, psychological flexibility, self-compassion, and positive emotions were direct predictors and correlated with the capacity for positive re-appraisal. The relationships between the underlying mechanisms within the model,

and additional outcome variables of resilience, satisfaction with academic experience, perceived stress and psychological distress were also examined.

Study 2 was divided into three sections, with hypotheses pertaining to Part A directly relating to the expansion of Study 1. Part A examined relationships between the underlying mechanisms within the MEI, and additional outcome variables of resilience, satisfaction with academic experience, perceived stress and psychological distress. Part A also provided support for the subsequent analyses designed to evaluate the MEI. Part B evaluated the MEI by examining the predicted direct causal and correlational relationships among variables in the model and aimed to establish mindfulness as a predictor of underlying mechanisms within the MEI. Finally, Part C further evaluated the MEI to provide specific information regarding the ways in which individual mindfulness subscales of the FFMQ cultivated specific mechanisms within the MEI. This element of the study was considered essential in providing specific information designed to guide the development of MBIs with EA university students.

The results showed that higher resilience and SAE was significantly correlated with higher mindfulness, psychological flexibility, self-compassion, positive emotions and positive re-appraisal. Higher perceived stress and psychological distress were also significantly associated with lower mindfulness, psychological flexibility, self-compassion, positive emotions and positive re-appraisal. These results suggest that higher resilience and lower perceived stress and psychological distress were associated with the protective mechanisms identified within the MEI.

Higher mindfulness was also a significant predictor of all aspects of the model, including higher psychological flexibility, self-compassion, positive emotions and positive re-appraisal. These results provided evidence for higher levels of mindfulness as a predictor of all mechanisms proposed within the MEI. Higher Self-compassion and higher psychological flexibility were also significant predictors of higher positive re-appraisal, with self-compassion the greatest predictor. These results provide support for the essential role of self-compassion in the MEI, and highlight that the capacity for cultivating a mindful, compassionate relationship with the self and connectedness to a sense of common humanity is a predictor of EA university students' capacity to positively re-appraise stressful experiences as either benign or beneficial. These results also highlight the capacity for elevated psychological and response flexibility predicts enhanced capacity to appraise stressful events as benign or beneficial in EAs. Overall, these results provided preliminary evidence for the

MEI as a framework for promoting positive re-appraisal, resilience and psychological well-being within this population.

To investigate the components of mindfulness and the constructs' role in predicting components identified within the MEI, the five subscales of FFMQ were examined separately to determine the strength and direction of each subscale as predictors of psychological flexibility, self-compassion, positive emotions, and positive re-appraisal. Table 49 below summaries the findings of Study 2 results, identifying the strongest subscale predictor for each.

Table 49

Summary of Results Identifying Strongest Five Facet Mindfulness Questionnaire Subscale Predictor for each Model Eudaimonic Integration Component

MEI Component	FFMQ Subscale Predictors	Strongest Subscale Predictor
Psychological Flexibility	Describing, Acting with Awareness, Non-judging of Inner Experience, Non-reactivity to Inner experience	Non-judging of Inner Experience
Self-compassion	Observing, Acting with Awareness, Non-judging of Inner Experience, Non-reactivity to Inner experience	Non-reactivity to Inner Experience
Positive Emotion	Observe, Describe, Acting with Awareness	Acting with Awareness
Positive Re-appraisal	Observe	Observe (Self-compassion identified as a stronger predictor than the FFMQ subscales)

The results of Study 2 provided support for the MEI and the process via which positive re-appraisal is facilitated in this population. Whilst mindfulness was essential in cultivating psychological flexibility and self-compassion, the cultivation of self-compassion was a critical aspect of facilitating positive re-appraisal. Results of Study 2 are novel and extended research into positive re-appraisal and resilience for EAs studying in Australia, providing evidence for the multifaceted nature of promoting adaptive coping resources during this life cycle transition. Study 2 results also provide support for the MEI as a guiding framework for enhancing student's psychological well-being and satisfaction with academic experience. There is a strong need for evidence-based models such as the MEI to provide a

guiding framework for the development of effective MBIs with EAs. There is limited evidence based and effective MBI's in Australia designed specifically to target EA student's successful transition to university and into adulthood. As such, development and evaluation of an MBI based on the MEI was required. To examine the effectiveness in both the MEI and pilot MBI, an at-risk population such as young medical students was considered appropriate within an Australian context.

Evaluation of the Mindful Awareness Resilience Skills Training Program

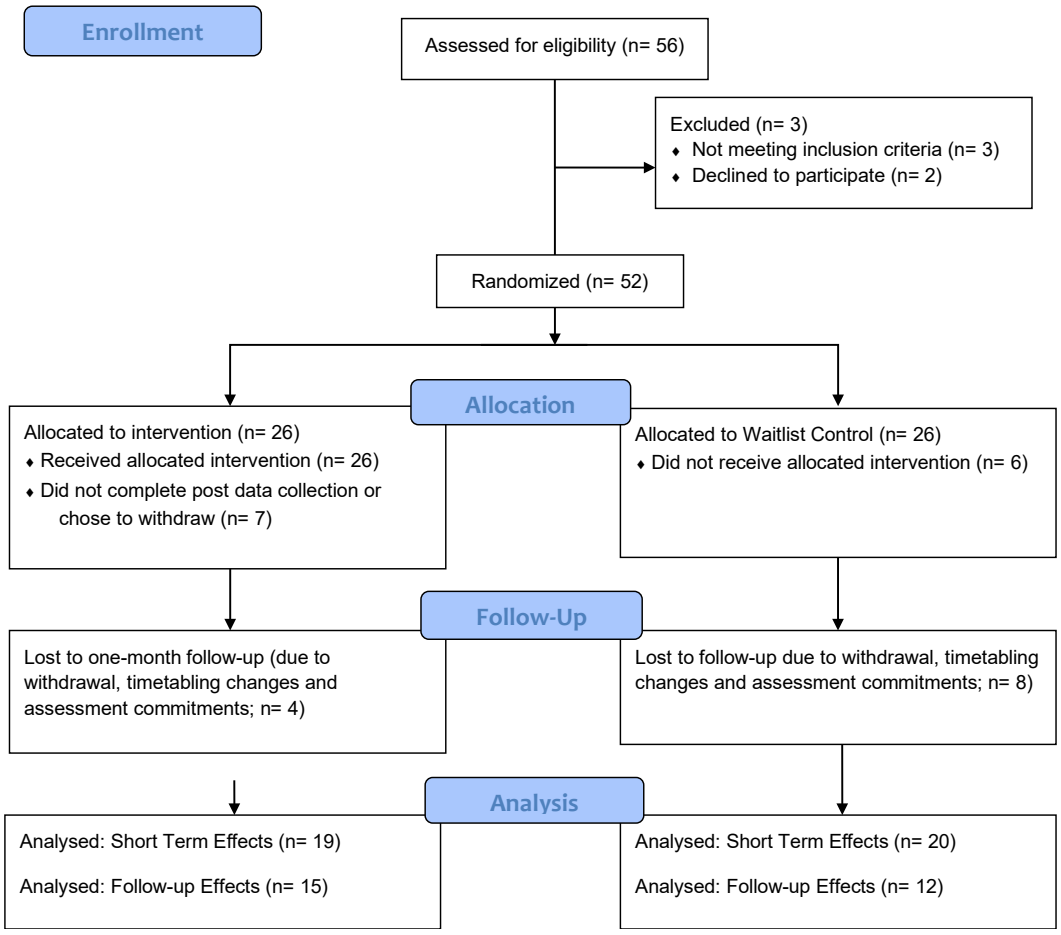
To address current research gaps, Chapter 5 reviewed the literature regarding the development of MBI's with university EA medical students, a sub-group at risk of higher stress and psychological distress. This chapter briefly reviewed the MEI and proposed ways this model can act as a guiding framework for the development of MBI's specific to this population. Finally, a new pilot intervention program with EA university students was proposed, the six-session MARST-P and explore how this program may effectively target factors within the MEI specific to an at-risk population of medical students.

Subsequently, Study 3 conducted a RCT of the pilot six-session MARST-P with an EA medical student population from Bond University, Australia. The study was a single-blind, group randomised waitlist-controlled trial examining the pilot MARST-P, intervention verses non-intervention. Study 3 was divided into two parts, Part A of the study evaluated the efficacy of the pilot six-session MARST-P by assessing differences between the Intervention and Waitlist-Control Groups across variables within the MEI at pre, post and one-month follow-up. To obtain collateral data via physiological measures, Part B of the study examined differences and percentage change of spot cortisol assays taken pre, post and one-month following the MARST-P intervention for both groups. Spot cortisol assay taken before and after intervention provides a snapshot of the immediate stress-reduction effects of therapy. For this reason, salivary cortisol has been advocated as an objective biomarker of the efficacy of psychotherapy (Hellhammer et al., 2009).

Figure 17 below shows a flow diagram based on the 2010 CONSORT Flow Diagram guidelines of the progress through the phases of the randomised trial of the Intervention and Waitlist-Control groups from screening, group allocation, follow-up, and data analysis.

Figure 17

Phases of the Randomised Control Trial of the Intervention and Waitlist-Control Group



Overall, the results provided support for the effectiveness of pilot MARST-P in targeting factors identified within the MEI. Compared to the Waitlist-Control Group, those in the Intervention Group reported significantly higher mindfulness, psychological flexibility, self-compassion, positive re-appraisal, and resilience scores post-intervention. These results were maintained at one-month follow-up. Positive emotions were also significantly higher in the Intervention Group compared with the Waitlist-Control group at one-month follow-up. Consistent with theories such as Broaden and Build Theory (Fredrickson, 1998), these results suggested that positive emotions may take time to cultivate within this population, however once experienced continue to contribute to the increasing and expanding nature and interplay between the adaptive components and resources within the MEI. Importantly, the Intervention Group also reported significantly lower perceived stress and psychological distress scores

compared to the Waitlist-Control Group at post and one-month Follow-up. Thus, this provides further support for the effectiveness of the MEI as a guiding framework for the development of MBI's, and support for the pilot six-session MARST-P as a preventative medical student mental health strategy. Results of the cortisol analysis using spot assays showed t change from baseline was not significantly different between the Intervention and Waitlist-Control groups at post and one-month follow-up intervention. Similarly, the percentage change from baseline was not significantly different between groups at post and one-month follow-up for cortisol levels.

Overall, these results suggest that in EA medical students from Australia, the MEI is effective in predicting components of resilience and therefore the concept of EI. The MARST-P also shows efficacy in targeting the MEI components. Therefore, future effective MBIs could incorporate MEI factors in order to enhance positive re-appraisal, psychological well-being and resilience in this population.

Implications and Recommendations

The findings presented in chapters 2, 4, and 6 have implications for institutions and policy makers, young people and their families, researchers and clinicians. This section highlights and summarises some of the key implications.

Implications for Theraputic and Early Intervention Support

As noted in Chapters 1 and 2, universities and institutions around the world are reporting increasing and widespread levels of psychological distress, poor university adjustment, academic failure, substance abuse and even significant psychopathology in young people within the general university population (Byrd & McKinney, 2012; Dennhardt & Murphy, 2013; Dvorakova et al., 2018). EAs engaged in high demand programs such as medicine are also considered to be at elevated risk for stress-related impacts, including higher psychological distress and psychopathology, chronic stress and burnout, compared to the general EA university population (Dryrbye et al., 2006; McConville et al., 2017). Specifically, within Australian university settings there has been an urgent call for researchers to better understand the issues of young people; to support the capacity for both the university and mental health sectors in effectively responding to the needs of this group (The National Centre of Excellence in Youth Mental Health, 2017).

Chapter 2 and 5 highlighted that for preventative interventions to be effective, they need to be built around relevant knowledge of the developmental, social/political, and systemic processes regarding both risk and protective factors. When these components are accurately

identified, they can serve as targets of universal prevention and intervention programs to promote adaptive processes, resilience and well-being whilst shifting maladaptive pathways (Dvorakova et al., 2018; Sevinc et al., 2018). The results of Chapters 4 and 5 also highlighted the crucial role of mindfulness meditation in cultivating both positive reappraisal and resiliency resources with this population, providing support for the MEI as a guiding framework for preventative interventions (see Chapter 5). The results of Chapter 5 provide evidence for the importance for the role of mindfulness in cultivating resources such as psychological flexibility, self-compassion, positive emotions and how these components facilitate positive re-appraisal. Given the mental health issues and associated maladaptive coping in young university students' preventative frameworks designed to strengthen students' cognitive, emotional and relational skills via mindfulness are one important strategy to support well-being and foster resilience.

The results of Chapter 6 also showed efficacy for the effectiveness of a pilot MBI based on the MEI framework, aimed at enhancing resources identified within the MEI as well as reducing psychological distress in EAs engaged in high demand programs. The results of this chapter highlighted the importance of targeting all facets, with a focus on both mindfulness and self-compassion skills in fostering positive reappraisal within young people studying medicine in Australia.

Taking into consideration the reported increasing mental health concerns in this population and the results of the outlined studies (see Chapters 3, 5 and 7), the most significant clinical implication from this thesis is the need to integrate greater early (i.e., commencement of first year university studies), developmentally appropriate and universal access to effective support strategies, particularly MBIs, into universities around Australia and internationally. This thesis provides both an effective model and framework, as well as a pilot MBI designed to address this need. The results of this thesis highlight how MEI skills and practice can both alleviate distress and nurture positive, eudaimonic capacities during this critical developmental period. Furthermore, university and community mental health sectors must ensure those students entering the first year of university should be given additional mental health support and psychoeducation regarding their current developmental and systemic transition, as well as an understanding of the importance of developing effective coping skills and resilience as they move towards self-differentiation. Psychoeducation of this nature could begin within senior secondary school, to reduce stigma around accessing support and enhancing understanding and openness to the importance of accessing support during EA.

Finally, this research also provided a more comprehensive definition and understanding of adaptation during young people's first life cycle transition, proposing the new term, EI to describe the process of fostering adaptive self-regulation, meaning making and self-compassion during this developmental stage with an emphasis on understanding the integrated neurobiology and balanced, adaptive components of mind and body considered within the context of relational systems (see Chapter 3). That is, where the individual is moving towards a differentiated sense of self within social spheres.

Through moving towards integrated neurobiology, young people can navigate these stressors and relationships with increasing psychological flexibility and self-differentiation, remaining healthily connected and confidently autonomous during times of adversity (Seigel, 2010; Brown, 2012). This new concept further extended systemic theories by proposing the quality and balance within relationships with others is not the only relationship salient to a resilient stress response. Moving towards an accepting and compassionate self-relationship, was proposed as a critical foundation during EA in moving towards balance and stability of mind and body and self-differentiation. Self-compassion was considered an essential component of maintaining self- regulation, psychological flexibility and beneficial meaning making throughout life.

Implications for the Education Sector

It is evident that young university students are reporting high levels of psychological distress and symptoms of mental health problems that may negatively affect their academic progress. Despite many universities offering on-campus and medical services, the ongoing and increasing mental health concerns of young people suggest these services may not be enough. It is evident that on-campus health and counselling services have a high level of need to meet and support for mental health and wellbeing is an essential component to enable university students to effectively manage the stressors of university life and maintain their academic progress. However there are still barriers to engaging with these mental health support services, with many young people unaware or perceiving a lack of need.

The results of Studies 1 to 3 provide universities with insight and understanding into the needs of this developmental stage, as well as the increased vulnerabilities of this population. The current research highlights the essential role universities play in shaping the resilience and mental health of young people. To address the alarming rates of mental ill-health in young people, universities have a responsibility to provide greater access to education and awarness to young people regarding the vulnerabilies associated with the

developmental stage of EA. This would assist to normalise the challenges associated with this life cycle transtion, as well as normalise the process of accessing therpautic support to enhance resilience. A greater shift needs to occur at every level to embody university culture that supports these aspects and values supporting young people during life's transitions.

The results of Study 2 and 3 also highlight the need for universities to offer greater access to accessible, age appropriate and evidence based MBIs for this population. The results of Study 2 and 3 highlight the efficacy of the MEI and the MARST-P as an effective framework for building resiliency skills (i.e., psychological flexibility, self-compassion, positive emotions and positive re-appraisal), reducing stress and psychological distress, providing an effective support program template for this population (both general and at risk). This suggests that offering openly accessible MBIs aimed at the EA population, separate from specific mental health services, is a useful addition to robust clinical interventions delivered by university counselling services.

The MARST-P tested in this trial presents as an acceptable, feasible, and effective component of wider student mental health strategies. Public health increasingly favours interventions to promote mental wellbeing placed in settings such as educational institutions; therefore, whether these findings have a wider application merits further study. As preveiously mentioned in Chapter 6, it is important that MBIs are offered to EAs by qualified and experienced clinicians and group facilitators to maximise intervention effectiveness and outcomes.

Universities play a key role in shaping young people's transition into EA. The journey through university provides a golden, yet underused, opportunity for prevention of mental illness and promotion of resilience and self-differentiation in young people. By addressing the research gaps pertianing to this population, this thesis contributes guidance to the enducation sector on how to effectively target EA resilience and well-being.

Implications for Emerging Adults and Their Families

This research provides evidence for the importance of both educating young people on and providing access to MBIs during EA. The newly proposed concept of EI in Chapter 3 provides a more comprehensive and systemic definition and understanding of resilience in this population. EI provides an integrated and systemic view of the process of self-differentiation for young people, where fostering adaptive self-regulation, meaning making and wisdom during and following adversity involves integrated neurobiology and balanced, adaptive components of mind and body considered within the context of relational systems

(Brown, 2012; Seigel, 2012). The results of Study 3 (Chapter 6) also expand systemic theories by providing evidence for the key role of fostering a compassionate and accepting self-relationship as a critical foundation for resilience and psychological well-being during this first life cycle transition. That is, both mindfulness and self-compassion skills play an essential role for enhancing resilience and psychological well-being in young people attending university. Additionally, the MEI (Chapter 4) provides evidence for those factors underpinning resilience and psychological well-being in this population.

Overall, this thesis aimed to highlight the essential need for researchers, institutions and practitioners to adopt a systemic and preventative approach to understanding this population and how to best support them. Providing education to young people and their families around this first life cycle transition can assist young people to accept these experiences as well as that of their family and broader systems. Providing access to MBIs such as the MARST-P which provides information on this first life cycle transition as a normal part of transition to university, would assist young people and their families to successfully navigate this launching process. The MEI and the MARST-P provide access to a developmentally appropriate and effective framework and support program.

Such interventions could begin in senior schooling, to maximise transitional outcomes for this population. Young people making the transition to university know more about themselves and the process they are going through. They are aware they are not alone, as their peers make a collective transition towards self-differentiaion. Young people would also then be inducted into a university system and culture where effective and developmentally appropriate support is the norm, promoting a foundation of resiliency skills to carry forward into subsequent life cycle transitions and throughout life.

Implications for Researchers

The result of studies 1 to 3, provide evidence for the concept of EI, the MEI and MARST -P as effective and developmentally appropriate frameworks and interventions for enhancing resilience and psychological well-being in EA university students in Australia. With ever increasing rates of mental ill-health in this population, this thesis provides efficacy for further evaluation of the MEI and MARST-P with EAs from different cultural contexts. This thesis also highlights the importance of researchers understanding the systemic and developmental considerations specific to this population when working to promote psychological well-being and resilience.

Limitations of the Research Program

Study-specific strengths and limitations have been highlighted and discussed throughout this thesis. Therefore, this section presents a general overview of main issues pertaining to the program of research and recommendations for future research.

This body of research contributes significantly to addressing relevant research gaps by conceptualising EAs within the context and systemic and developmental considerations and promoting psychological well-being and inner resources and qualities underpinning positive re-appraisal and EI via mindfulness-based approaches in this population. However, self-report methods and social desirability biases present as limitations and future research should incorporate the collection of collateral data as well as consider the inclusion of a social desirability scale to avoid potential confounding of results. Secondly, Study 1 could be replicated with a larger and diverse sample of EAs from diverse cultural backgrounds, to provide a more detailed and comprehensive understanding of resilience across the globe. Similarly, Study 2 and 3 could also be replicated with larger samples of the Australian population to increase the generalisability of the results.

Study 2 could also be expanded to include examination of students from a range of international and globalised regions to provide specific information regarding the MEI and associated mindfulness components needed to facilitate critical resources within the model. The MEI could also be examined in both younger and older populations to assess the applicability of this within these populations, and to ascertain specific components relevant to targeting EI within these developmental stages. Furthermore, the MEI could be more specifically assessed with populations transitioning through various life cycle stages. For example, focusing on populations that are newly married, transitioning to becoming parents or the family with adolescents. Data could be collected from multiple sources within these systems (i.e., schools, family members etc).

Furthermore, whilst spot cortisol assay was taken within Study 3 to examine physiological changes to cortisol hormone because of the intervention, future studies could enhance this collection method and incorporate other methods of qualitative analysis. An understanding of the effects of MBI's on physiological markers is still emerging with somewhat conflicting results. For example, Dawson et al., (2019) reported that included studies measuring physiological markers such as cortisol did not find significant differences post intervention,, however power was limited due to sample size within these studies. The authors suggest that the inclusion of non-clinical participants may reduce the likelihood of

detecting physiological improvements and the modification of biological parameters may require more time and practice.

Other studies have documented salivary alpha‐amylase as a reliable surrogate marker of the sympathetic nervous system, the other major stress axis in the body (Hellhammer et al., 2007; Stapleton et al., 2020). The cortisol awakening response (CAR) is part of the daily profile and has been demonstrated to be associated with psychosocial variables and perceived chronic stress and well‐being (Hellhammer et al., 2007). Taken together, salivary cortisol and alpha‐amylase daily profiles provide insight into physiological functioning under basal non‐stressful conditions. Future research could adopt the established collection protocol by Kirschbaum and Hellhammer (1989), where saliva is sampled to examine the cortisol awakening profile as well as to explore the daily cortisol profile using eight saliva samples collected over two consecutive days, with the first sample was taken in bed upon awakening, then 15 minutes later, 30 minutes later and 45 minutes after awakening, then at 9, 13, 17 and 21 hours. Future research could also control for physiological confounders such as: age, sex, health, medication; and behavioural confounders such as: smoking, food intake and eating habits, caffeine, alcohol, physical activity, and sleep.

Furthermore, whilst sample size was clearly established as adequate for the evaluation of the MARST-P, future research could replicate using a larger sample to provide greater efficacy and generalisability of the results. This would also allow for sub-group analyses to be conducted. Moreover, whilst an at-risk population of EA university students was examined (i.e., medical students) to test the efficacy of the pilot program in targeting factors within the MEI, future studies could also explore the effectiveness of the six-session MARST-P with a general EA university population. This would allow for further revision of the program should differences between medical students and the general university population be identified. Finally, whilst this body of research has focused on EA university students, future research could also assess both applicability of the MEI and the six-session MARST-P with EA university students (i.e., those aged 18-29) compared to those university students aged 30 years and older as well as comparing first and final year/postgraduate students. This would also allow for the development and revision of preventative mental health initiatives for all university students. Such research would expand beyond the EA, to provide greater understanding and support of how to promote EI across life cycle transitions for various populations.

Conclusion

EA presents a developmental phase with increased vulnerability to psychological distress and psychopathology. Gloablly, universities and institutions are reporting increasing and widespread levels of psychological distress, poor university adjustment, academic failure, substance abuse and even significant psychopathology in young people within the general university population (Byrd & McKinney, 2012; Dennhardt & Murphy, 2013; Dvorakova et al., 2018). As a result, many young people struggle to successfully complete their degrees and many withdraw altogether (Dvorakova et al., 2018). EAs engaged in high demand programs such as medicine are also considered to be at elevated risk for stress-related impacts, including higher psychological distress and psychopathology, chronic stress and burnout, compared to the general EA university population (Dryrbye et al., 2006; McConville et al., 2017). Within Australian university settings there has been an urgent call for researchers to better understand the issues of young people; to support the capacity for both the university and mental health sectors in effectively responding to the needs of this group (The National Centre of Excellence in Youth Mental Health, 2017).

Transition points such as attending university present predictable periods of time associated with increased change, uncertainty and vulnerability to stress and psychological distress across the lifespan (Carter & McGoldrick, 1999). It is evident that considerable adaptive coping resources and resilience skills are needed to navigate this life cycle transition for young people attending university, as well as successfully addressing the developmental stage relevant tasks related to young people's professional, social and inner lives (Roeser, 2012). However, there are increasing reports indicating that many young university students lack coping resources and resilience skills necessary to navigate this normative transition on the path to adulthood (Acharya et al., 2018; Cleary et al., 2011; Dvorakova et al., 2018).

Universities have a key institutional opportunity to positively impact on young people's lives, however clear research gaps remain regarding how these settings can best equip students with resiliency skills and shape their well-being, academic progress and successful resolution of key developmental tasks (Byrd & McKinney, 2012). Government and educators are turning to researchers for a deeper understanding of this developmental phase as well as health promotion interventions designed to decrease stress and promote resilience in this population (Delany et al., 2015; Regehr et al., 2013, & Shiralkar & Harris, 2013).

The overarching aim of this thesis was to improve the conceptualisation and understanding of resilience and psychological well-being in EA university students via

mindfulness-based approaches. Overall. This thesis revealed that resilience must be considered within developmental, systemic and cultural contexts surrounding EAs. This thesis also aimed to provide a new conceptualisation of resilience with this population, the concept of EI. Finally, to address relevant research gaps this thesis also provided significant preliminary evidence for the MEI as a framework for understanding the promotion of EI in young people from Australia. Using the MEI as a guiding framework, this thesis also provided preliminary evidence for the pilot MARST-P with at-risk EA medical students from Australia. Both the MEI and MARST-P may provide an effective framework and intervention for enhancing psychological well-being and resilience in young university students and potentially mitigating long-term psychological distress in this population. Ongoing research is essential in this area to evaluate appropriate models and interventions with this population across the globe.

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APPENDICES

Appendix A

Explanatory Statement and Consent Form Study 1

BOND UNIVERSITY
BRINGING AMBITION TO LIFE

FACULTY OF HUMANITIES & SOCIAL SCIENCES
Bond University
Gold Coast, Queensland 4229
Australia
Toll free 1800 650 121
(within Australia)
Ph: +61 7 5595 2522
Fax: +61 7 5595 2545
(from overseas)
Email: hss@bond.edu.au
ABN 88 010 694 121
CRICOS CODE 00017B

EXPLANATORY STATEMENT

PROJECT RO-1794

The cultural differences and impact of university students' experience and perceived support at a university level on psychological adjustment, resilience, academic self-efficacy and coping.

You have been selected to participate in a research study evaluating university students and perceived support at a university level on psychological adjustment, resilience, academic self-efficacy and coping. Research is being conducted by Dr Aileen Pidgeon, Assistant Professor Psychology at Bond University, PhD candidate Ms Breeana Souter.

Purpose of the research
The aim of the study is to examine the cultural differences among first year students from Australia, North America and Hong Kong on perceived support, perceived stress, psychological well-being, resilience and satisfaction with academic experience at university.

What you will be asked to do
Participants who meet criteria to participate in the study will be invited to complete a series of self-report questionnaires online which will take approximately 30 minutes.

Your participation is voluntary
Participation in this study is **completely voluntary** and you may withdraw at any time without risking any negative consequences. If you choose to withdraw your participation in this study, the information you have provided will be immediately destroyed. To be eligible to participate in this study, you must be aged 18 years or over and not currently enrolled as a university student.

Your confidentiality
All the data collected in this study will be treated with complete **confidentiality** and not made accessible to any person outside of the two researchers working on this project. The information obtained from you will be dealt with in a manner that ensures you remain **anonymous**. Data will be stored in a secured location for a five-year period in accordance with the guidelines set out by the Bond University Human Research Ethics Committee.

The expected benefits
This current research will add to the growing body of research on the psychological impacts of stress and resilience students transition to and experience of university.

Risks associated with participation
It is unlikely that you will be adversely affected by participating in this study. However, if at any time you experience feelings of distress or discomfort, you may wish to talk to a mental health professional. Please contact the Bond University Counselling Service (07) 5595 4002, Lifeline 131314, or Beyond Blue 1300 224 636 for confidential support and assistance.

Questions, further information, feedback to you
If you would like any further information, or if you have any questions regarding your participation in this project, please contact Assistant Professor Psychology, Dr Aileen Pidgeon at apdigeon@bond.edu.au, phone number (07) 55952510.

The ethical conduct of this research
Any research that is performed at Bond University is conducted in accordance with the National Statement on Ethical Conduct in Human Research (2007). Should you have any complaints concerning the manner in which this research (RO-1794) is being conducted, please do not hesitate to contact the Bond University Research Ethics Complaints Officer.
Bond University Research Ethics Officer
Bond University Human Research Ethics Committee

Bond University, Gold Coast, QLD 4229
Phone: 07 55954194 Fax: 07 55951120
Email: buhrec@bond.edu.au

Your agreement to participate
If you have read and understand the conditions of the study and are willing to participate, please complete the attached consent form and return the signed form to the researcher.
Thank you for your participation.

Dr Aileen M. Pidgeon
Assistant Professor Psychology
Bond University
Phone: (07) 55952510
apidgeon@bond.edu.au

Ms Breeana Souter
Clinical Psychologist and PhD Candidate
breeana.obrien@student.bond.edu.au

Appendix B

Explanatory Statement and Consent Form Study 2

BOND UNIVERSITY
BRINGING AMBITION TO LIFE

FACULTY OF HUMANITIES & SOCIAL SCIENCES
Bond University
Gold Coast, Queensland 4229
Australia
Toll free 1800 650 121
(within Australia)
Ph: +61 7 5595 2522
Fax: +61 7 5595 2545
(from overseas)
Email: hss@bond.edu.au
ABN 88 010 694 121
CRICOS CODE 00017B

EXPLANATORY STATEMENT

PROJECT RO-1919

Evaluating the Mindful Cognitive Model of Cultivating Resilience with university students: An international Study

You have been selected to participate in a research study evaluating the efficacy of a recently developed model for resilience. Research is being conducted by PhD candidate Ms Breeana Souter under the supervision of Dr Aileen Pidgeon, Assistant Professor Psychology at Bond University.

Purpose of the research

The aim of the study is to evaluate the efficacy of the Mindful Cognitive Model of Cultivating Resilience with university students from Australia and compare the model to a new student population. The model looks at the relationship between mindfulness, psychological flexibility, positive emotions, positive re-appraisal, self-compassion, resilience, perceived stress and psychological distress among university students.

What you will be asked to do

Participants who meet criteria to participate in the study will be invited to complete a series of self-report questionnaires online which will take approximately 30 minutes. The questionnaires will assess mindfulness, resilience, psychological flexibility, positive emotions, positive re-appraisal, self-compassion, perceived stress and psychological distress

Your participation is voluntary

Participation in this study is **completely voluntary** and you may withdraw at any time without risking any negative consequences. If you choose to withdraw your participation in this study, the information you have provided will be immediately destroyed. To be eligible to participate in this study, you must be aged 18 years or over and not currently enrolled as a university student.

Your confidentiality

All the data collected in this study will be treated with complete **confidentiality** and not made accessible to any person outside of the two researchers working on this project. The information obtained from you will be dealt with in a manner that ensures you remain **anonymous**. Data will be stored in a secured location for a five-year period in accordance with the guidelines set out by the Bond University Human Research Ethics Committee.

The expected benefits

This current research will add to the growing body of research on the psychological and physiological benefits of mindfulness in increasing self-awareness and resilience in university students to enhance well-being and reduce stress.

Risks associated with participation

It is unlikely that you will be adversely affected by participating in this study. However, if at any time you experience feelings of distress or discomfort, you may wish to talk to a mental health professional. Please contact the Bond University Counselling Service (07) 5595 4002, Lifeline 131314, or Beyond Blue 1300 224 636 for confidential support and assistance.

Questions, further information, feedback to you

If you would like any further information, or if you have any questions regarding your participation in this project, please contact Assistant Professor Psychology, Dr Aileen Pidgeon at apdigeon@bond.edu.au, phone number (07) 55952510.

The ethical conduct of this research

Any research that is performed at Bond University is conducted in accordance with the National Statement on Ethical Conduct in Human Research (2007). Should you have any complaints concerning the manner in which this research (RO-1919) is being conducted, please do not hesitate to contact the Bond University Research Ethics Complaints Officer.
Bond University Research Ethics Officer

Bond University Human Research Ethics Committee
Bond University, Gold Coast, QLD 4229
Phone: 07 55954194 Fax: 07 55951120
Email: buhrec@bond.edu.au

Your agreement to participate
If you have read and understand the conditions of the study and are willing to participate, please complete the attached consent form and return the signed form to the researcher.
Thank you for your participation.

Dr Aileen M. Pidgeon
Assistant Professor Psychology
Bond University
Phone: (07) 55952510
apidgeon@bond.edu.au

Ms Breeana Souter
Clinical Psychologist and PhD Candidate
breeana.obrien@student.bond.edu.au

Appendix C

Explanatory Statement and Consent Form Study 3

BOND UNIVERSITY
BRINGING AMBITION TO LIFE

FACULTY OF HUMANITIES & SOCIAL SCIENCES
Bond University
Gold Coast, Queensland 4229
Australia
Toll free 1800 650 121
(within Australia)
Ph: +61 7 5595 2522
Fax: +61 7 5595 2545
(from overseas)
Email: hss@bond.edu.au
ABN 88 010 694 121
CRICOS CODE 00017B

EXPLANATORY STATEMENT

PROJECT RO-1920

Evaluating the Effectiveness of the MARST Program in Cultivating Psychological and Physiological Resilience and Well-being in Medical Students: A Randomised Control Trial

You have been selected to participate in a research study evaluating the efficacy of a mindful awareness program for increasing resilience and enhancing self-awareness. This research is being conducted by PhD candidate Ms Breeana Souter and Dr Aileen Pidgeon, Assistant Professor Psychology at Bond University.

Purpose of the research
The aim of the study is to evaluate the efficacy of the Mindful Awareness Resilience Skills Training (MARST) Program for university students to enhance resilience, mindfulness, self-compassion, campus connectedness, coping and decrease stress. The study also aims to examine the relationship between mindfulness and cortisol levels within the body.

What you will be asked to do
Participants who meet criteria to participate in the MARST program will be randomly allocated into the MARST Training or Control Group. All participants will also be required to complete questionnaires during the research study at pre and post training, and at one and three months following the training. The questionnaires will assess resilience, psychological well-being, mindfulness and self-compassion, perceived stress and campus connectedness and will take approximately 30 minutes to complete. All participants will also be asked to consent to providing a saliva sample pre, post,4 weeks following the MARST program to assess levels of cortisol.

Participants in Training group will be required to attend 6 x 1.5 hour weekly MARST training sessions completed over 6 consecutive weeks. This program will provide information on stress and resilience, and strategies to enhance resilience at university. The program will also provide information on mindfulness and offer engagement in a number of mindfulness meditations. Participants in the Control group will be offered the opportunity to participate in the MARST program following the completion of the research.

Your participation is voluntary
Participation in this study is voluntary and you do not have to answer any questions or participate in scheduled blood tests unless you wish to do so. You have the right to withdraw from this study at any time, without consequence.

Your confidentiality
All information you provide in this research will remain confidential. Participant names will be removed from the questionnaires as they are received and will be replaced with a numeric code to ensure the confidentiality of your responses. This code will enable the researchers to match your questionnaires during the study and ensure confidentiality. This code will be assigned to your corresponding saliva sample to ensure all information remains anonymous. The data will be reported in a general, group manner and no information that could identify any individual participant will be published. All information will be securely stored by Bond University in accordance with Bond University policy and destroyed after five years. To be eligible to participate in this study, you must be aged 18 years or over.

The expected benefits
This current research will add to the growing body of research on the psychological and physiological benefits of increasing self-awareness and resilience in university students to enhance well-being and reduce stress.

Risks associated with participation
It is unlikely that you will be adversely affected by participating in this study. However, if at any time you experience feelings of distress or discomfort, you may wish to talk to a mental health professional. Please contact the Bond University Counselling Service (07) 5595 4002, Lifeline 131314, or Beyond Blue 1300 224 636 for confidential support and assistance.

Questions, further information, feedback to you
If you would like any further information, or if you have any questions regarding your participation in this project, please contact Assistant Professor Psychology, Dr Aileen Pidgeon at apdigeon@bond.edu.au, phone number (07) 55952510.

The ethical conduct of this research
Any research that is performed at Bond University is conducted in accordance with the National Statement on Ethical Conduct in Human Research (2007). Should you have any complaints concerning the manner in which this research (RO-1531) is being conducted, please do not hesitate to contact the Bond University Research Ethics Complaints Officer.
Bond University Research Ethics Officer
Bond University Human Research Ethics Committee
Bond University, Gold Coast, QLD 4229
Phone: 07 55954194 Fax: 07 55951120
Email: buhrec@bond.edu.au

Your agreement to participate
If you have read and understand the conditions of the study and are willing to participate, please complete the attached consent form and return the signed form to the researcher. Thank you for your participation.

Dr Aileen M. Pidgeon
Assistant Professor Psychology
Bond University
Phone: (07) 55952510
apidgeon@bond.edu.au

Ms Breeana Souter
Clinical Psychologist and PhD Candidate
breeana.obrien@student.bond.edu.au

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BRINGING AMBITION TO LIFE

FACULTY OF HUMANITIES & SOCIAL SCIENCES
Bond University
Gold Coast, Queensland 4229
Australia
Toll free 1800 650 121
(within Australia)
Ph: +61 7 5595 2522
Fax: +61 7 5595 2545
(from overseas)
Email: hss@bond.edu.au
ABN 88 010 694 121
CRICOS CODE 00017B

RESEARCH CONSENT FORM

I agree to participate in Bond University Research Project Number RO-1920. By signing below, I confirm that I am over 18 years of age and currently enrolled as a university student at Bond University and have read and understood the information package and in particular have noted that:

- I understand that my involvement in this research will include completing self-report questionnaires offered at pre, post, one and one month (which will take approximately 30 minutes);
- I also understand this will require me to provide a saliva sample at pre, post and one month following the training;
- I understand I will randomly be assigned to a Training or Control Group, with the Training group undertaking the initial 6 x 1.5 hour weekly MARST program training sessions;
- I understand the Control group will be offered the opportunity to participate in the MARST program following the completion of this research;
- I have had any questions answered to my satisfaction;
- I understand the risks and benefits involved with this research;
- I understand that my participation in this research is voluntary and anonymous, and that in no way will any information I provide be able to be linked back to me;
- I understand the results of this study will be presented at an international conference, however no identifying information relating to myself will be presented;
- I understand that if I have any additional questions, I can contact the research team;
- I understand that I am free to withdraw at any time, without comment or penalty;
- I understand if I become distressed during the course of completing the questionnaires, I will be offered a list of counselling support services at the end of the survey;
- I understand that a lay summary of the overall results of the study will be made available to me at the end of the analysis period and I will be notified that these are available through my preferred communication system (e.g., mail / email);
- I understand that I can contact the Bond University Human Research Ethics Committee, c/o Bond University Office of Research Services, Bond University, Gold Coast, 4229, Tel: +61 7 5595 4194 Fax: +61 7 5595 1120 Email: buhrec@bond.edu.au, if I have any concerns about the ethical conduct of the project; and
- I agree to participate in the project.

Name: _____

Signature: _____

Date: _____

If you would like more information on this study or would like to be informed of the complete research findings, please contact Dr Aileen Pidgeon or Ms Breeana Souter via the contact information listed below.

Your participation in this research is greatly appreciated.

Yours sincerely,

Dr Aileen M. Pidgeon
Assistant Professor Psychology
Bond University
Phone: (07) 55952510
aileen.pidgeon@bond.edu.au

Ms Breeana Souter
Clinical Psychologist and PhD Candidate
breeana.obrien@student.bond.edu.au

Appendix D

Questionnaire Package Study 1

BOND UNIVERSITY RESEARCH PROJECT RO:1794
QUESTIONNAIRE PACKAGE

Age: _____

Gender: ☐ Male ☐ Female

University:

☐ Bond University (Australia) ☐ University of Florida (USA) ☐ University of Hong Kong (Hong Kong)

Current University Year: _____

Current Degree: _____

Current University Status:

☐ Domestic Student ☐ International Student

Enrolment Status:

☐ Full-time ☐ Part-time

Current Residence

☐ On-Campus ☐ Family home ☐ Off Campus Accommodation ☐ Own home ☐ Other

Perceived Stress Scale

The questions below ask you about your feelings and thoughts **during the last month**. In each case, you will be asked to indiciate by circling *how often* you felt or thought a certain way.

	0 = Never	**1 = Almost Never**	**2 = Sometimes**	**3 = Fairly Often**	**4 = Very Often**
1	In the last month, how often have you been upset because of something that happened unexpectantly?				0 1 2 3 4
2	In the last month, how often have you felt that you were unable to control the important things in your life?				0 1 2 3 4
3	In the last month, how often have you felt nervous and “stressed”?				0 1 2 3 4
4	In the last month, how often have you felt confident about your ability to handle your personal problems?				0 1 2 3 4
5	In the last month, how often have you felt that things were going your way?				0 1 2 3 4
6	In the last month, how often have you found that you could not cope with all the things that you had to do?				0 1 2 3 4
7	In the last month, how often have you been able to control irritations in your life?				0 1 2 3 4
8	In the last month, how often have you felt that you were on top of things?				0 1 2 3 4
9	In the last month, how often have you been angered because of things that were outside of your control?				0 1 2 3 4
10	In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?				0 1 2 3 4

The Resilience Scale

Please read the following statements. To the right of each you will find seven numbers, ranging from **'1' (Strongly Disagree) to "7" (Strongly Agree)**. Circle the number which best indicates your feelings about that statements. For example, if you strongly disagree with a statement, circle "1". If you are neutral, circle "4", and if you strongly agree, circle "7", etc.

Circle the number in the appropriate column	**Strongly Disagree**						**Strongly Agree**
1. When I make plans, I follow through with them.							
2. I usually manage one way or another.							
3. I am able to depend on myself more than anyone else.							
4. Keeping interested in things is important to me.							
5. I can be on my own if I have to.							
6. I feel proud that I have accomplished things in life.							
7. I usually take things in stride.							
8. I am friends with myself.							
9. I feel that I can handle many things at a time.	1	2	3	4	5	6	7
10. I am determined.							
11. I seldom wonder what the point of it all is.							
12. I take things one day at a time.							
13. I can get through difficult times because I've experienced difficulty before.							
14. I have self-discipline.							
15. I keep interested in things.							
16. I can usually find something to laugh about.							
17. My belief in myself gets me through hard times.							

18. In an emergency, I'm someone people can generally rely on. 19. I can usually look at a situation in a number of ways. 20. Sometimes I make myself do things whether I want to or not. 21. My life has meaning. 22. I do not dwell on things that I can't do anything about. 23. When I'm in a difficult situation, I can usually find my way out of it. 24. I have enough energy to do what I have to do. 25. It's okay if there are people who don't like me.							

DASS-21

Please read each statement and **circle a number 0, 1, 2, or 3, which indicates how much the statement applied to you <u>over the past week</u>.** There are no right or wrong answers. Do not spend too much time on any statement.

0 Did not apply to me at all – NEVER
1 Applied to me to some degree, or some of the time – SOMETIMES
2 Applied to me to a considerable degree, or a good part of the time – OFTEN
3 Applied to me very much, or most of the time – ALMOST ALWAYS

		N	S	O	AA
1	I find it hard to wind down.	0	1	2	3
2	I was aware of dryness of my mouth.	0	1	2	3
3	I couldn't seem to experience any positive feeling at all.	0	1	2	3
4	I experienced difficulty breathing (e.g. excessively rapid breathing, breathlessness in the absence of physical exertion)	0	1	2	3
5	I found it difficult to work up the initiative to do things.	0	1	2	3
6	I tended to over-react to situations.	0	1	2	3
7	I experienced trembling (e.g. in the hands)	0	1	2	3
8	I felt that I was using a lot of nervous energy.	0	1	2	3
9	I was worried about situations in which I might panic and make a fool of myself.	0	1	2	3
10	I felt that I had nothing to look forward to.	0	1	2	3
11	I found myself getting agitated.	0	1	2	3
12	I found it difficult to relax.	0	1	2	3
13	I felt down-hearted and blue.	0	1	2	3
14	I was intolerant of anything that kept me from getting on with what I was doing.	0	1	2	3
15	I felt I was close to panic.	0	1	2	3
16	I was unable to become enthusiastic about anything.	0	1	2	3
17	I felt I wasn't worth much as a person.	0	1	2	3
18	I felt that I was rather touchy.	0	1	2	3
19	I was aware of the action of my heart in the absence of physical exertion (e.g. sense of heart rate increase, heart missing a beat)	0	1	2	3
20	I felt scared without any good reason.	0	1	2	3
21	I felt that life was meaningless.	0	1	2	3

Satisfaction with Academic Experience

Please indicate the number that best corresponds to your agreement with each statement below.

1	2	3	4	5
Strongly disagree	Somewhat disagree	Netural	Somewhat agree	Strongly agree

___My classes are appropriately challenging.

___My classes are what I expected in terms of their difficulty.

___I feel that this university is the best university for me academically.

___I feel that the faculty members provide adequate support.

___I believe this university will prepare me to succeed.

Appendix E

Questionnaire Package Study 2 and 3

BOND UNIVERSITY RESEARCH PROJECT RO-: 1919

QUESTIONNAIRES

Age:_____

Gender: _____

Highest Education:

☐ Year 10 ☐ Year 12 ☐ Undergraduate degree ☐ Postgraduate degree

Current Degree: _____

Current University Status:

☐ Full-time ☐ Part-time

Current Residence

☐ On-Campus ☐ Family home ☐ Off Campus Accommodation ☐ Own home ☐ Other

Employment Status:

☐ Full-time ☐ Part-time ☐ Casual ☐ Not working

Do you have concerns about being able to fund your studies this year?

☐ Yes ☐ No

BOND UNIVERSITY RESEARCH PROJECT RO:1920

QUESTIONNAIRES

Age: _____

Gender: _____

Highest Education:

☐ Year 10 ☐ Year 12 ☐ Undergraduate degree ☐ Postgraduate degree

Current Degree: _____

Current University Status:

☐ Full-time ☐ Part-time

Current Residence

☐ On-Campus ☐ Family home ☐ Off Campus Accommodation ☐ Own home ☐ Other

Employment Status:

☐ Full-time ☐ Part-time ☐ Casual ☐ Not working

Do you have concerns about being able to fund your studies this year?

☐ Yes ☐ No

Practices:

Have you engaged in MINDFULNESS meditation training in the past year? ☐ Yes ☐ No

Do you meditate? ☐ Yes or ☐ No ☐ Daily ☐ Weekly ☐ Monthly

Perceived Stress Scale

The questions below ask you about your feelings and thoughts **during the last month**. In each case, you will be asked to indiciate by circling *how often* you felt or thought a certain way.

0 = Never	1 = Almost Never	2 = Sometimes	3 = Fairly Often	4 = Very Often

1	In the last month, how often have you been upset because of something that happened unexpectantly?	0	1	2	3	4
2	In the last month, how often have you felt that you were unable to control the important things in your life?	0	1	2	3	4
3	In the last month, how often have you felt nervous and "stressed"?	0	1	2	3	4
4	In the last month, how often have you felt confident about your ability to handle your personal problems?	0	1	2	3	4
5	In the last month, how often have you felt that things were going your way?	0	1	2	3	4
6	In the last month, how often have you found that you could not cope with all the things that you had to do?	0	1	2	3	4
7	In the last month, how often have you been able to control irritations in your life?	0	1	2	3	4
8	In the last month, how often have you felt that you were on top of things?	0	1	2	3	4
9	In the last month, how often have you been angered because of things that were outside of your control?	0	1	2	3	4
10	In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?	0	1	2	3	4

AAQ-2

The following statements measure psychological flexibility. Rate the degree to which these statements apply to you using the following scale (1 = Never True to 7 – Always True). There is no right or wrong answer. Do not spend too much time with any one statement and do not leave any unanswered.

1	2	3	4	5	6	7
Never True	Very Seldom True	Seldom True	Sometimes True	Frequently True	Alwmost Always True	Always True

1. My painful experiences and memories make it difficult for me to live a life that I would value.	1	2	3	4	5	6	7
2. I'm afraid of my feelings.	1	2	3	4	5	6	7
3. I worry about not being able to control my worries and feelings.	1	2	3	4	5	6	7
4. My painful memoniries prevent me from having a fulfilling life.	1	2	3	4	5	6	7
5. Emotions cause problems in my life.	1	2	3	4	5	6	7
6. It seems most people are handling their lives better than I am.	1	2	3	4	5	6	7
7. Worries get in the way of my success.	1	2	3	4	5	6	7

PANAS

This scale consists of a number of words that describe different feelings and emotions. Read each item and then list the number from the scale below next to each word. Indicate to what extent you feel this way right now, that is, at the present moment *OR* indiciate the extent you have felt this way over the past week (circle the instructions you followed when taking this measure).

1	2	3	4	5
Very Slightly or Not at All	**A Little**	**Moderately**	**Quite a Bit**	**Extremely**

_____	1. Interested	_____	11. Irritable
_____	2. Distressed	_____	12. Alert
_____	3. Excited	_____	13. Ashamed
_____	4. Upset	_____	14. Inspired
_____	5. Strong	_____	15. Nervous
_____	6. Guilty	_____	16. Determined
_____	7. Scared	_____	17. Attentive
_____	8. Hostile	_____	18. Jittery
_____	9. Enthusiastic	_____	19. Active
_____	10. Proud	_____	20. Afraid

The Resilience Scale

Please read the following statements. To the right of each you will find seven numbers, ranging from **'1' (Strongly Disagree) to "7" (Strongly Agree)**. Circle the number which best indicates your feelings about that statements. For example, if you strongly disagree with a statement, circle "1". If you are neutral, circle "4", and if you strongly agree, circle "7", etc.

Circle the number in the appropriate column	**Strongly Disagree**						**Strongly Agree**
1. I usually manage one way or another.	1	2	3	4	5	6	7
2. I feel proud that I have accomplished things in life.	1	2	3	4	5	6	7
3. I usually take things in stride.	1	2	3	4	5	6	7
4. I am friends with myself.	1	2	3	4	5	6	7
5. I feel that I can handle many things at a time.	1	2	3	4	5	6	7
6. I am determined.	1	2	3	4	5	6	7
7. I can get through difficult times because I've experienced difficulty before.	1	2	3	4	5	6	7
8. I have self-discipline.	1	2	3	4	5	6	7
9. I keep interested in things.	1	2	3	4	5	6	7
10. I can usually find something to laugh about.	1	2	3	4	5	6	7
11. My belief in myself gets me through hard times.	1	2	3	4	5	6	7
12. In an emergency, I'm someone people can generally rely on.	1	2	3	4	5	6	7
13. My life has meaning.	1	2	3	4	5	6	7
14. When I'm in a difficult situation, I can usually find my way out of it.	1	2	3	4	5	6	7

Five Facet Mindfulness Questionnaire

Please rate each of the following statements using the scale provided. Write the number in the blank that best describes your own opinion of what is generally true for you.

1	2	3	4	5
Never or Very Rarely True	Rarely True	Sometimes True	Often True	Very Often or Always True

___1. When I'm walking, I deliberately notice the sensations of my body moving.
___2. I'm good at finding words to describe my feelings.
___3. I criticize myself for having irrational or inappropriate emotions.
___4. I perceive my feelings and emotions without having to react to them.
___5. When I do things, my mind wanders off and I'm easily distracted.
___6. When I take a shower or bath, I stay alert to the sensations of water on my body.
___7. I can easily put my beliefs, opinions, and expectations into words.
___8. I don't pay attention to what I'm doing because I'm daydreaming, worrying, or otherwise distracted.
___9. I watch my feelings without getting lost in them.
___10. I tell myself I shouldn't be feeling the way I'm feeling.
___11. I notice how foods and drinks affect my thoughts, bodily sensations, and emotions.
___12. It's hard for me to find the words to describe what I'm thinking.
___13. I am easily distracted.
___14. I believe some of my thoughts are abnormal or bad and I shouldn't think that way.
___15. I pay attention to sensations, such as the wind in my hair or sun on my face.
___16. I have trouble thinking of the right words to express how I feel about things
___17. I make judgments about whether my thoughts are good or bad.
___18. I find it difficult to stay focused on what's happening in the present.
___19. When I have distressing thoughts or images, I "step back" and am aware of the thought or image without getting taken over by it.
___20. I pay attention to sounds, such as clocks ticking, birds chirping, or cars passing.
___21. In difficult situations, I can pause without immediately reacting.
___22. When I have a sensation in my body, it's difficult for me to describe it because I can't find the right words.
___23. It seems I am "running on automatic" without much awareness of what I'm doing.
___24. When I have distressing thoughts or images, I feel calm soon after.
___25. I tell myself that I shouldn't be thinking the way I'm thinking.
___26. I notice the smells and aromas of things.
___27. Even when I'm feeling terribly upset, I can find a way to put it into words.
___28. I rush through activities without being really attentive to them.

1	2	3	4	5
Never or Very Rarely True	Rarely True	Sometimes True	Often True	Very Often or Always True

___29. When I have distressing thoughts or images I am able just to notice them without reacting.
___30. I think some of my emotions are bad or inappropriate and I shouldn't feel them.
___31. I notice visual elements in art or nature, such as colors, shapes, textures, or patterns of light and shadow.
___32. My natural tendency is to put my experiences into words.
___33. When I have distressing thoughts or images, I just notice them and let them go.
___34. I do jobs or tasks automatically without being aware of what I'm doing.
___35. When I have distressing thoughts or images, I judge myself as good or bad, depending what the thought/image is about.
___36. I pay attention to how my emotions affect my thoughts and behavior.
___37. I can usually describe how I feel at the moment in considerable detail.
___38. I find myself doing things without paying attention.
___39. I disapprove of myself when I have irrational ideas.

Self-Compassion Scale

Please read each statement carefully before answering. To the left of each item, indicate how often you behave in the stated manner, using the following scale from 1(Almost Never) to 5(Almost Always):

1	2	3	4	5
Almost Never				**Almost Always**

_____ 1. I'm disapproving and judgmental about my own flaws and inadequacies.
_____ 2. When I'm feeling down I tend to obsess and fixate on everything that's wrong.
_____ 3. When things are going badly for me, I see the difficulties as part of life that everyone goes through.
_____ 4. When I think about my inadequacies, it tends to make me feel more separate and cut off from the rest of the world.
_____ 5. I try to be loving towards myself when I'm feeling emotional pain.
_____ 6. When I fail at something important to me I become consumed by feelings of inadequacy.
_____ 7. When I'm down and out, I remind myself that there are lots of other people in the world feeling like I am.
_____ 8. When times are really difficult, I tend to be tough on myself.
_____ 9. When something upsets me I try to keep my emotions in balance.
_____ 10. When I feel inadequate in some way, I try to remind myself that feelings of inadequacy are shared by most people.
_____ 11. I'm intolerant and impatient towards those aspects of my personality I don't like.
_____ 12. When I'm going through a very hard time, I give myself the caring and tenderness I need.
_____ 13. When I'm feeling down, I tend to feel like most other people are probably happier than I am.
_____ 14. When something painful happens I try to take a balanced view of the situation.
_____ 15. I try to see my failings as part of the human condition.
_____ 16. When I see aspects of myself that I don't like, I get down on myself.
_____ 17. When I fail at something important to me I try to keep things in perspective.
_____ 18. When I'm really struggling, I tend to feel like other people must be having an easier time of it.
_____ 19. I'm kind to myself when I'm experiencing suffering.
_____ 20. When something upsets me I get carried away with my feelings.
_____ 21. I can be a bit cold-hearted towards myself when I'm experiencing suffering.
_____ 22. When I'm feeling down I try to approach my feelings with curiosity and openness.
_____ 23. I'm tolerant of my own flaws and inadequacies.
_____ 24. When something painful happens I tend to blow the incident out of proportion.
_____ 25. When I fail at something that's important to me, I tend to feel alone in my failure.
_____ 26. I try to be understanding and patient towards those aspects of my personality I don't like.

DASS-21

Please read each statement and circle a **number 0, 1, 2, or 3, which indicates how much the statement applied to you** <u>over the past week</u>**.** There are no right or wrong answers. Do not spend too much time on any statement.

0 Did not apply to me at all – NEVER
1 Applied to me to some degree, or some of the time – SOMETIMES
2 Applied to me to a considerable degree, or a good part of the time – OFTEN
3 Applied to me very much, or most of the time – ALMOST ALWAYS

		N	S	O	AA
1	I find it hard to wind down.	0	1	2	3
2	I was aware of dryness of my mouth.	0	1	2	3
3	I couldn't seem to experience any positive feeling at all.	0	1	2	3
4	I experienced difficulty breathing (e.g. excessively rapid breathing, breathlessness in the absence of physical exertion)	0	1	2	3
5	I found it difficult to work up the initiative to do things.	0	1	2	3
6	I tended to over-react to situations.	0	1	2	3
7	I experienced trembling (e.g. in the hands)	0	1	2	3
8	I felt that I was using a lot of nervous energy.	0	1	2	3
9	I was worried about situations in which I might panic and make a fool of myself.	0	1	2	3
10	I felt that I had nothing to look forward to.	0	1	2	3
11	I found myself getting agitated.	0	1	2	3
12	I found it difficult to relax.	0	1	2	3
13	I felt down-hearted and blue.	0	1	2	3
14	I was intolerant of anything that kept me from getting on with what I was doing.	0	1	2	3
15	I felt I was close to panic.	0	1	2	3
16	I was unable to become enthusiastic about anything.	0	1	2	3
17	I felt I wasn't worth much as a person.	0	1	2	3
18	I felt that I was rather touchy.	0	1	2	3
19	I was aware of the action of my heart in the absence of physical exertion (e.g. sense of heart rate increase, heart missing a beat)	0	1	2	3
20	I felt scared without any good reason.	0	1	2	3
21	I felt that life was meaningless.	0	1	2	3

Cognitive Emotion Regulation Questionnaire

Everyone gets confronted with negative events now and then and everyone responds to them in his or her own way. By the following questions you are asked to indicate what you generally think you think when you experience negative or unpleasant events. Please indicate on a scale from 1=almost never, 2 = sometimes, 3=regularly, 4=often and 5=almost always.

I feel that I am the one to blame for it	1	2	3	4	5
I feel that I am the one who is responsible for what has happened	1	2	3	4	5
I think about the mistakes I have made in this matter	1	2	3	4	5
I think that basically the cause must lie within myself	1	2	3	4	5
I think that I have to accept that this has happened	1	2	3	4	5
I think that I have to accept the situation	1	2	3	4	5
I think that I cannot change anything about it	1	2	3	4	5
I think that I must learn to live with it	1	2	3	4	5
I often think about how I feel about what I have experienced	1	2	3	4	5
I am preoccupied with what I think and feel about what I have experienced	1	2	3	4	5
I want to understand why I feel the way I do about what I have experienced	1	2	3	4	5
I dwell upon the feelings the situation has evoked in me	1	2	3	4	5
I think of nicer things than what I have experienced	1	2	3	4	5
I think of pleasant things that have nothing to do with it	1	2	3	4	5
I think of something nice instead of what has happened	1	2	3	4	5
I think about pleasant experiences	1	2	3	4	5
I think of what I can do best	1	2	3	4	5
I think about how I can best cope with the situation	1	2	3	4	5
I think about how to change the situation	1	2	3	4	5
I think about a plan of what I can do best	1	2	3	4	5
I think I can learn something from the situation	1	2	3	4	5
I think that I can become a stronger person as a result of what has happened	1	2	3	4	5
I think that the situation also has its positive sides	1	2	3	4	5
I look for the positive sides to the matter	1	2	3	4	5
I think that it all could have been much worse	1	2	3	4	5

I think that other people go through much worse experiences	1	2	3	4	5
I think that it hasn't been too bad compared to other things	1	2	3	4	5
I tell myself that there are worse things in life.	1	2	3	4	5
I often think that what I have experienced is much worse than what others have experienced	1	2	3	4	5
I keep thinking about how terrible it is what I have experienced	1	2	3	4	5
I often think that what have experienced is the worst that can happen to a person	1	2	3	4	5
I continually think how horrible the situation has been	1	2	3	4	5
I feel that others are to blame for it	1	2	3	4	5
I feel that others are responsible for what has happened	1	2	3	4	5
I think about the mistakes others have made in this matter	1	2	3	4	5
I feel that basically the cause lies with others	1	2	3	4	5

Satisfaction with Academic Experience

Please indicate the number that best corresponds to your agreement with each statement below.

1	2	3	4	5
Strongly disagree	**Somewhat disagree**	**Netural**	**Somewhat agree**	**Strongly agree**

___My classes are appropriately challenging.

___My classes are what I expected in terms of their difficulty.

___I feel that this university is the best university for me academically.

___I feel that the faculty members provide adequate support.

___I believe this university will prepare me to succeed.

Appendix F

Cortisol Instructions Study 3

Research Project RO1920
MARST Program – Six Session Program

Measuring Cortisol - Providing Your Saliva Sample:

The MARST program will commence on Friday 5th June 2015 at 8:00am. ***You will be asked to attend at 7:30am on June 5th to provide a saliva sample prior to the commencement of session one.*** Coffee and breakfast will be provided after the sample is provided!!

In order to avoid the possibility of contaminating substances in the saliva that could interfere with the immunoassay, it is recommend the following precautions be taken prior to providing saliva:

- Avoid alcohol for 12 hours before sample collection.
- Do not eat a major meal within 60 minutes of sample collection.
- Avoid dairy products for 20 minutes before sample collection.
- Avoid foods with high sugar or acidity, or high caffeine content, immediately before sample collection, since they may compromise the assay by lowering saliva pH and increasing bacterial growth.
- Rinse mouth with water to remove food residue before sample collection, and swallow to increase hydration.
- Wait at least 10 minutes after rinsing before collecting saliva to avoid sample dilution.

Instructions for providing your saliva sample:

1. Rinse your mouth with water 10 minutes prior to collection.
2. You will be provided with a 5 cm straw and cyrovial. ***Please write your ID on the cyrovial label, this must be the same ID you record on your questionnaire packages.***
3. Allow saliva to pool in the mouth. It may be helpful to imagine eating your favourite food.
4. With head tilted forward, drool down the straw and collect saliva in the cryovial. (It is normal for saliva to foam)
5. Repeat as often as necessary until sufficient sample is collected. One mL (excluding foam) is adequate.
6. Please place your sample (with lid securely fasted) into the container provided by the research team on the day.

Thank you again for your participation in this research. If you have any questions please contact:

Breeana Souter - breeana.obrien@student.bond.edu.au

Clinical Psychology Registrar and PhD Candidate

Appendix G

Overview of the Content of the Six Session Mindful Awareness and Resilience Skills Training Program

Session	Session Overview
One	• Review content of MARST-P objectives, guidelines and schedule. • Psychoeducation on the stress response, resilience and mindfulness. • Handout: Identifying stress symptoms • Home activities and resources provided (including pause bracelet)
Two	• Weekly review and debrief • Introduction to formal and informal mindfulness practice • Guided informal and formal mindfulness meditation practice. • Benefits of mindfulness • Introduce and practice mindfulness with loving kindness meditation. • Psychoeducation and practice application of the Mindful Awareness Integration Tool. • Home activities
Three	• Guided mindfulness meditation practice. • Weekly review and debrief • Psychoeducation on the cognitive model • Practice formal mindfulness of thoughts meditation • Practice application of the Mindful Awareness Integration Tool • Handout: Forming an informal and formal mindfulness routine • Group discussion and feedback
Four	• Guided mindfulness meditation practice. • Weekly review and debrief • Psychoeducation around avoidance of emotions • Handout: Identifying unhelpful strategies for managing emotion • Guided formal meditation on emotion • Group discussion and feedback
Five	• Guided mindfulness meditation practice. • Weekly review and debrief • Introduction to self-compassion and the benefits • Guided Loving Kindness Meditation • Social supports and connections • Handout: Connecting with support networks • Group discussion and feedback
Six	• Guided mindfulness meditation practice. • Weekly review and debrief • Relapse prevention – self-care plan • Program review and reflections (feedback and discussion)

Appendix H

Sample Handout from the MARST-P

MARST Program

Establishing a Formal Meditation Practice

- To begin first the step of relaxing/letting go!
- Take a couple of full deep breaths, and with each exhale, consciously let go, relaxing the face, shoulders, hands, and stomach area.
- Being present has two interdependent qualities of recognizing, or noticing what is happening, and allowing whatever is experienced without any judgment, resistance or grasping.
- Practice meditation by receiving all the domains of experience with a mindful, open attention. These domains include breath and sensations; feelings (pleasant, unpleasant and neutral); sense perceptions, thoughts and emotions; and awareness itself.
- There is no attempt to manipulate or control experience – just allow it to be and pass naturally!!

My Formal Mindfulness Meditation Practice

What time of the day would be best for my practice?

_____

_____

What duration will I sit for?

_____

What space can I use for my practice that I know will be quite and safe from disruptions?

_____

_____

What intentions would I like to set up my practice over the coming week (e.g., focusing on my breathing, calming my mind, accepting my experience without judgement etc.)?

_____

_____

What are my goals for committing to a mindfulness practice? What would I like to be different in my life?

_____

_____

Appendix I

Email Flyer and Allocation Letters for Intervention and Waitlist Control Groups

FREE STRESS REDUCTION PROGRAM

Research Project: RO1920 Evaluating the Effectiveness of Mindful Awareness and Resilience Stress Training for Medical Students: A Randomised Control Trial

FREE mindfulness based cognitive program providing skills on how to enhance mindfulness and resilience during university!

Group is only 1 hour per week over 6 weeks around classes.

Sessions commencing Week 4 of Semester 172

Free refreshments each session

Confidential group

Program facilitated by a registered psychologist and PhD researcher

LEARN INNOVATIVE WAYS TO

BOUNCE BACK FROM STRESS!

- Reduce Stress
- Enhance Concentration and Attention
- Increase Mindfulness Skills
- Build Resilience
- Enhance Resilient Thinking

Please contact Breeana Souter (O'Brien) to find out how you can participate in this research!

Email:
breeana.obrien@student.bond.edu.au

BOND UNIVERSITY
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FACULTY OF HUMANITIES & SOCIAL SCIENCES
Bond University
Gold Coast, Queensland 4229
Australia
Toll free 1800 650 121
(within Australia)
Ph: +61 7 5595 2522
Fax: +61 7 5595 2545
(from overseas)
Email: hss@bond.edu.au
ABN 88 010 694 121
CRICOS CODE 00017B

Dear Participant,

This letter is to inform you that you have been randomly assigned to the MARST TRAINING GROUP as part of the research study (RO-1920) and are invited to participate in the initial training: Mindful Awareness and Resilience Skills Training (MARST) for medical students.

This training will take place over six consecutive weeks in one-hour weekly sessions, with a brief follow-up meeting four weeks after the final session. The training dates and times for the sessions are listed below.

MARST Program Session Times/Locations:

1. Friday 23rd June 2017 from 12:00-1:15pm in BLD06_02_07(PRE SALIVA SAMPLE COLLECTION)
2. Friday 30th June 2017 from 1:30-2:30pm in BLD06_02_07
3. Friday 7th July 2017 from 1:00-2:00pm in BLD06_02_05
4. Friday 14th July 2017 from 2-3pm in BLD06_02_05
5. Friday 21st July 2017 from 1-2pm in BLD06_02_07
6. Friday 28th July 2017 from 1-2pm in BLD06_02_07 (POST SALIVA SAMPLE COLLECTION)
7. Friday 25th August 2017 from 10:00:10:30am in BLD06_02_05 (FOLLOW-UP SALIVA SAMPLE COLLECTION)

Please bring your phone/device, water and something to write with to each session.

We would like to take this opportunity to thank you for your time and participation in the research project.

Yours sincerely,

Dr Aileen M. Pidgeon
Assistant Professor Psychology
Bond University
Phone: (07) 55952510
aileen.pidgeon@staff.bond.edu.au

Ms Breeana Souter
Clinical Psychology Registrar & PhD Candidate
Bond University
breeana.obrien@student.bond.edu.au

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FACULTY OF HUMANITIES & SOCIAL SCIENCES
Bond University
Gold Coast, Queensland 4229
Australia
Toll free 1800 650 121
(within Australia)
Ph: +61 7 5595 2522
Fax: +61 7 5595 2545
(from overseas)
Email: hss@bond.edu.au
ABN 88 010 694 121
CRICOS CODE 00017B

Dear Participant,

This letter is to inform you that you have been randomly assigned to the WAITLIST CONTROL GROUP as part of the research study RO-1920: Evaluating the efficacy of the Mindful Awareness and Resilience Skills Training (MARST) for Medical Students.

You will be asked to complete on online questionnaire package prior to the dates below, and attend briefly to provide your saliva sample at the times below. The questionnaire will be emailed to the account provided at screening.

Data collection times:

1. Friday 23rd June 2017 from 12:00-12:15pm in BLD06_02_07 (PRE SALIVA SAMPLE COLLECTION)
2. Friday 28th July 2017 from 1:00-1:15pm in BLD06_02_07 (POST SALIVA SAMPLE COLLECTION)
3. Friday 25th August 2017 from 10:00-10:15am in BLD06_02_05 (FOLLOW-UP SALIVA SAMPLE COLLECTION)

You will also have the opportunity to complete the MARST training in September semester 2017.

We would like to take this opportunity to thank you for your time and participation in the research project and look forward to seeing you.

Yours sincerely,

Dr Aileen M. Pidgeon
Assistant Professor Psychology
Bond University
Phone: (07) 55952510
aileen.pidgeon@staff.bond.edu.au

Ms Breeana Souter
Clinical Psychology Registrar & PhD Candidate
Bond University
breeana.obrien@student.bond.edu.au

Appendix J

Data Output for Studies 1, 2 and 3

Study 1 Data Output

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
dass21 t	Between Groups	6474.178	2	3237.089	12.749	.000
	Within Groups	59159.36	233	253.903		
	Total	65633.54	235			
dass21s	Between Groups	602.410	2	301.205	7.189	.001
	Within Groups	9761.573	233	41.895		
	Total	10363.98	235			
dass21a	Between Groups	137.715	2	68.858	1.817	.165
	Within Groups	8828.997	233	37.893		
	Total	8966.712	235			
dass21d	Between Groups	7955.514	2	3977.757	93.359	.000
	Within Groups	9927.469	233	42.607		
	Total	17882.98	235			
pss t	Between Groups	572.148	2	286.074	11.808	.000
	Within Groups	5644.852	233	24.227		
	Total	6217.000	235			
sae t	Between Groups	372.949	2	186.474	14.787	.000
	Within Groups	2938.251	233	12.611		
	Total	3311.199	235			
rs t	Between Groups	4185.737	2	2092.868	6.647	.002
	Within Groups	73365.92	233	314.875		
	Total	77551.66	235			

Multiple Comparisons

Scheffe

Dependent Variable	(I) University	(J) University	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
dass21 t	Florida	Hong Kong	.52503	2.91081	.984	-6.6460	7.6960
		Australia	10.7414*	2.56251	.000	4.4285	17.0543
	Hong Kong	Florida	-.52503	2.91081	.984	-7.6960	6.6460
		Australia	10.2164*	2.50680	.000	4.0407	16.3920
	Australia	Florida	-10.7414*	2.56251	.000	-17.0543	-4.4285
		Hong Kong	-10.2164*	2.50680	.000	-16.3920	-4.0407
dass21s	Florida	Hong Kong	-3.43826*	1.18240	.016	-6.3512	-.5254
		Australia	-3.82759*	1.04091	.001	-6.3919	-1.2632
	Hong Kong	Florida	3.43826*	1.18240	.016	.5254	6.3512
		Australia	-.38932	1.01828	.930	-2.8979	2.1193
	Australia	Florida	3.82759*	1.04091	.001	1.2632	6.3919
		Hong Kong	.38932	1.01828	.930	-2.1193	2.8979
dass21a	Florida	Hong Kong	-.80534	1.12450	.774	-3.5756	1.9649
		Australia	1.00000	.98994	.601	-1.4388	3.4388
	Hong Kong	Florida	.80534	1.12450	.774	-1.9649	3.5756
		Australia	1.80534	.96842	.178	-.5804	4.1911
	Australia	Florida	-1.00000	.98994	.601	-3.4388	1.4388
		Hong Kong	-1.80534	.96842	.178	-4.1911	.5804
dass21d	Florida	Hong Kong	4.76863*	1.19240	.000	1.8311	7.7062
		Australia	13.5690*	1.04972	.000	10.9829	16.1550
	Hong Kong	Florida	-4.76863*	1.19240	.000	-7.7062	-1.8311
		Australia	8.80033*	1.02690	.000	6.2705	11.3302
	Australia	Florida	-13.5690*	1.04972	.000	-16.1550	-10.9829
		Hong Kong	-8.80033*	1.02690	.000	-11.3302	-6.2705
pss t	Florida	Hong Kong	-.38209	.89914	.914	-2.5972	1.8330
		Australia	2.90517*	.79155	.001	.9551	4.8552
	Hong Kong	Florida	.38209	.89914	.914	-1.8330	2.5972
		Australia	3.28726*	.77434	.000	1.3796	5.1949
	Australia	Florida	-2.90517*	.79155	.001	-4.8552	-.9551
		Hong Kong	-3.28726*	.77434	.000	-5.1949	-1.3796
sae t	Florida	Hong Kong	3.07341*	.64870	.000	1.4753	4.6715
		Australia	.35345	.57108	.826	-1.0534	1.7603
	Hong Kong	Florida	-3.07341*	.64870	.000	-4.6715	-1.4753
		Australia	-2.71997*	.55867	.000	-4.0963	-1.3437
	Australia	Florida	-.35345	.57108	.826	-1.7603	1.0534
		Hong Kong	2.71997*	.55867	.000	1.3437	4.0963
rs t	Florida	Hong Kong	9.62625*	3.24153	.013	1.6405	17.6120
		Australia	.08621	2.85365	1.000	-6.9440	7.1164
	Hong Kong	Florida	-9.62625*	3.24153	.013	-17.6120	-1.6405
		Australia	-9.54004*	2.79161	.003	-16.4174	-2.6627
	Australia	Florida	-.08621	2.85365	1.000	-7.1164	6.9440
		Hong Kong	9.54004*	2.79161	.003	2.6627	16.4174

*. The mean difference is significant at the 0.05 level.

Descriptive Statistics

	University	rs_cat	Mean	Std. Deviation	N
dass21t	Florida	very high	21.4286	4.72077	7
		high	29.2000	13.50555	10
		moderate	35.8889	18.16878	18
		low	36.7692	13.74866	13
		very low	46.2857	11.91238	7
		Total	34.3636	15.54964	55
	Hong Kong	high	20.8889	10.72898	9
		moderate	30.4286	18.87902	14
		low	35.7692	14.25849	26
		very low	41.6667	17.82406	12
		Total	33.5082	16.64795	61
	Australia	very high	17.7500	11.63431	8
		high	15.5484	12.68815	31
		moderate	22.3077	17.12722	26
		low	29.3793	13.73321	29
		very low	40.7273	16.49904	11
		Total	23.8476	16.29935	105
	Total	very high	19.4667	8.99100	15
		high	19.2400	13.42486	50
		moderate	28.4828	18.54841	58
		low	33.2353	14.13804	68
		very low	42.4000	15.76902	30
		Total	29.1312	16.91170	221
dass21s	Florida	very high	3.1429	2.79455	7
		high	6.0000	6.53197	10
		moderate	7.0000	6.18347	18
		low	8.9231	7.00549	13
		very low	10.8571	4.87950	7
		Total	7.2727	6.19873	55
	Hong Kong	high	6.0000	2.64575	9
		moderate	9.5714	7.69330	14
		low	11.8462	6.19479	26
		very low	12.6667	7.15203	12
		Total	10.6230	6.63868	61
	Australia	very high	11.0000	7.09124	8
		high	8.4516	6.25480	31
		moderate	11.0000	7.57364	26
		low	12.8276	6.01230	29
		very low	14.1818	6.47793	11
		Total	11.0857	6.79382	105
	Total	very high	7.3333	6.70465	15
		high	7.5200	5.86320	50
		moderate	9.4138	7.28381	58
		low	11.7059	6.34590	68
		very low	12.8000	6.35935	30
		Total	10.0090	6.76756	221
dass21a	Florida	very high	1.4286	1.90238	7
		high	5.4000	3.53396	10
		moderate	8.7778	6.65587	18
		low	7.2308	4.28474	13
		very low	15.1429	5.27347	7
		Total	7.6727	6.10723	55
	Hong Kong	high	3.1111	2.47207	9
		moderate	6.8571	6.21236	14
		low	9.0769	5.40313	26
		very low	12.5000	8.05097	12
		Total	8.3607	6.44472	61
	Australia	very high	4.5000	4.50397	8
		high	3.4194	3.54753	31
		moderate	7.0769	6.84060	26
		low	7.8621	5.28964	29
		very low	14.1818	7.01168	11
		Total	6.7619	6.19790	105
	Total	very high	3.0667	3.76955	15
		high	3.7600	3.41999	50
		moderate	7.5517	6.57527	58
		low	8.2059	5.13855	68
		very low	13.7333	6.96263	30
		Total	7.4299	6.25379	221
dass21d	Florida	very high	16.8571	1.57359	7
		high	17.8000	6.35610	10
		moderate	20.1111	6.87612	18
		low	20.6154	5.96571	13
		very low	20.2857	6.77531	7
		Total	19.4182	6.06963	55
	Hong Kong	high	11.7778	9.18937	9
		moderate	14.0000	8.07656	14
		low	14.8462	6.32893	26
		very low	16.5000	6.15704	12
		Total	14.5246	7.14518	61
	Australia	very high	2.2500	2.71241	8
		high	3.6774	5.31907	31
		moderate	4.2308	5.25591	26
		low	8.6897	6.89256	29
		very low	12.3636	7.47359	11
		Total	6.0000	6.57501	105
	Total	very high	9.0667	7.85099	15
		high	7.9600	8.51879	50
		moderate	11.5172	9.49467	58
		low	13.3235	7.85397	68
		very low	15.8667	7.25750	30
		Total	11.6923	8.71860	221

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[d]
Intercept	Pillai's Trace	.780	242.886[b]	3.000	205.000	.000	.780	728.657	1.000
	Wilks' Lambda	.220	242.886[b]	3.000	205.000	.000	.780	728.657	1.000
	Hotelling's Trace	3.554	242.886[b]	3.000	205.000	.000	.780	728.657	1.000
	Roy's Largest Root	3.554	242.886[b]	3.000	205.000	.000	.780	728.657	1.000
University	Pillai's Trace	.528	24.609	6.000	412.000	.000	.264	147.657	1.000
	Wilks' Lambda	.477	30.625[b]	6.000	410.000	.000	.309	183.751	1.000
	Hotelling's Trace	1.088	36.985	6.000	408.000	.000	.352	221.908	1.000
	Roy's Largest Root	1.079	74.095[c]	3.000	206.000	.000	.519	222.285	1.000
rs_cat	Pillai's Trace	.278	5.280	12.000	621.000	.000	.093	63.359	1.000
	Wilks' Lambda	.731	5.691	12.000	542.671	.000	.099	59.801	1.000
	Hotelling's Trace	.357	6.054	12.000	611.000	.000	.106	72.647	1.000
	Roy's Largest Root	.321	16.596[c]	4.000	207.000	.000	.243	66.382	1.000
University * rs_cat	Pillai's Trace	.082	.826	21.000	621.000	.688	.027	17.349	.669
	Wilks' Lambda	.920	.825	21.000	589.199	.689	.027	16.578	.642
	Hotelling's Trace	.085	.824	21.000	611.000	.691	.028	17.313	.667
	Roy's Largest Root	.055	1.618[c]	7.000	207.000	.132	.052	11.324	.662

a. Design: Intercept + University + rs_cat + University * rs_cat

b. Exact statistic

c. The statistic is an upper bound on F that yields a lower bound on the significance level.

d. Computed using alpha = .05

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[e]
Corrected Model	dass21 t	17169.0[a]	13	1320.695	5.975	.000	.273	77.679	1.000
	dass21s	1524.41[b]	13	117.263	2.838	.001	.151	36.900	.990
	dass21a	2371.84[c]	13	182.450	6.060	.000	.276	78.778	1.000
	dass21d	8416.75[d]	13	647.443	16.135	.000	.503	209.752	1.000
Intercept	dass21 t	140710.6	1	140710.6	636.628	.000	.755	636.628	1.000
	dass21s	14061.15	1	14061.15	340.365	.000	.622	340.365	1.000
	dass21a	8606.154	1	8606.154	285.844	.000	.580	285.844	1.000
	dass21d	26818.99	1	26818.99	668.350	.000	.764	668.350	1.000
University	dass21 t	2358.203	2	1179.101	5.335	.006	.049	10.669	.835
	dass21s	560.402	2	280.201	6.783	.001	.062	13.565	.916
	dass21a	20.273	2	10.137	.337	.715	.003	.673	.103
	dass21d	5184.296	2	2592.148	64.598	.000	.384	129.197	1.000
rs_cat	dass21 t	9295.679	4	2323.920	10.514	.000	.169	42.057	1.000
	dass21s	766.680	4	191.670	4.640	.001	.082	18.558	.945
	dass21a	1933.233	4	483.308	16.053	.000	.237	64.210	1.000
	dass21d	734.309	4	183.577	4.575	.001	.081	18.300	.942
University * rs_cat	dass21 t	655.230	7	93.604	.424	.887	.014	2.965	.185
	dass21s	92.941	7	13.277	.321	.944	.011	2.250	.147
	dass21a	164.429	7	23.490	.780	.605	.026	5.461	.332
	dass21d	263.231	7	37.604	.937	.479	.031	6.560	.400
Error	dass21 t	45752.15	207	221.025					
	dass21s	8551.569	207	41.312					
	dass21a	6232.319	207	30.108					
	dass21d	8306.323	207	40.127					
Total	dass21 t	250468.0	221						
	dass21s	32216.00	221						
	dass21a	20804.00	221						
	dass21d	46936.00	221						
Corrected Total	dass21 t	62921.19	220						
	dass21s	10075.98	220						
	dass21a	8604.163	220						
	dass21d	16723.08	220						

a. R Squared = .273 (Adjusted R Squared = .227)

b. R Squared = .151 (Adjusted R Squared = .098)

c. R Squared = .276 (Adjusted R Squared = .230)

d. R Squared = .503 (Adjusted R Squared = .472)

e. Computed using alpha = .05

Multiple Comparisons

Scheffe

Dependent Variable	(I) rs_cat	(J) rs_cat	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
dass21 t	very high	high	.2267	4.37670	1.000	-13.3771	13.8304
		moderate	-9.0161	4.30648	.360	-22.4016	4.3694
		low	-13.7686*	4.24091	.035	-26.9503	-.5869
		very low	-22.9333*	4.70133	.000	-37.5461	-8.3205
	high	very high	-.2267	4.37670	1.000	-13.8304	13.3771
		moderate	-9.2428*	2.86902	.038	-18.1603	-.3252
		low	-13.9953*	2.76963	.000	-22.6039	-5.3867
		very low	-23.1600*	3.43336	.000	-33.8317	-12.4883
	moderate	very high	9.0161	4.30648	.360	-4.3694	22.4016
		high	9.2428*	2.86902	.038	.3252	18.1603
		low	-4.7525	2.65728	.527	-13.0120	3.5069
		very low	-13.9172*	3.34339	.002	-24.3093	-3.5252
	low	very high	13.7686*	4.24091	.035	.5869	26.9503
		high	13.9953*	2.76963	.000	5.3867	22.6039
		moderate	4.7525	2.65728	.527	-3.5069	13.0120
		very low	-9.1647	3.25851	.099	-19.2929	.9635
	very low	very high	22.9333*	4.70133	.000	8.3205	37.5461
		high	23.1600*	3.43336	.000	12.4883	33.8317
		moderate	13.9172*	3.34339	.002	3.5252	24.3093
		low	9.1647	3.25851	.099	-.9635	19.2929
dass21s	very high	high	-.1867	1.89219	1.000	-6.0680	5.6947
		moderate	-2.0805	1.86183	.870	-7.8674	3.7065
		low	-4.3725	1.83348	.228	-10.0714	1.3263
		very low	-5.4667	2.03253	.128	-11.7842	.8509
	high	very high	.1867	1.89219	1.000	-5.6947	6.0680
		moderate	-1.8938	1.24037	.675	-5.7491	1.9616
		low	-4.1859*	1.19740	.018	-7.9077	-.4641
		very low	-5.2800*	1.48435	.015	-9.8937	-.6663
	moderate	very high	2.0805	1.86183	.870	-3.7065	7.8674
		high	1.8938	1.24037	.675	-1.9616	5.7491
		low	-2.2921	1.14883	.411	-5.8629	1.2787
		very low	-3.3862	1.44545	.245	-7.8790	1.1066
	low	very high	4.3725	1.83348	.228	-1.3263	10.0714
		high	4.1859*	1.19740	.018	.4641	7.9077
		moderate	2.2921	1.14883	.411	-1.2787	5.8629
		very low	-1.0941	1.40876	.962	-5.4728	3.2846
	very low	very high	5.4667	2.03253	.128	-.8509	11.7842
		high	5.2800*	1.48435	.015	.6663	9.8937
		moderate	3.3862	1.44545	.245	-1.1066	7.8790
		low	1.0941	1.40876	.962	-3.2846	5.4728
dass21a	very high	high	-.6933	1.61535	.996	-5.7142	4.3275
		moderate	-4.4851	1.58943	.097	-9.4254	.4553
		low	-5.1392*	1.56523	.032	-10.0043	-.2741
		very low	-10.6667*	1.73516	.000	-16.0599	-5.2734
	high	very high	.6933	1.61535	.996	-4.3275	5.7142
		moderate	-3.7917*	1.05889	.014	-7.0830	-.5004
		low	-4.4459*	1.02221	.001	-7.6231	-1.2686
		very low	-9.9733*	1.26718	.000	-13.9120	-6.0346
	moderate	very high	4.4851	1.58943	.097	-.4553	9.4254
		high	3.7917*	1.05889	.014	.5004	7.0830
		low	-.6542	.98075	.978	-3.7025	2.3942
		very low	-6.1816*	1.23398	.000	-10.0171	-2.3461
	low	very high	5.1392*	1.56523	.032	.2741	10.0043
		high	4.4459*	1.02221	.001	1.2686	7.6231
		moderate	.6542	.98075	.978	-2.3942	3.7025
		very low	-5.5275*	1.20265	.000	-9.2655	-1.7894
	very low	very high	10.6667*	1.73516	.000	5.2734	16.0599
		high	9.9733*	1.26718	.000	6.0346	13.9120
		moderate	6.1816*	1.23398	.000	2.3461	10.0171
		low	5.5275*	1.20265	.000	1.7894	9.2655
dass21d	very high	high	1.1067	1.86486	.986	-4.6897	6.9031
		moderate	-2.4506	1.83494	.775	-8.1540	3.2528
		low	-4.2569	1.80700	.239	-9.8734	1.3597
		very low	-6.8000*	2.00318	.024	-13.0263	-.5737
	high	very high	-1.1067	1.86486	.986	-6.9031	4.6897
		moderate	-3.5572	1.22245	.080	-7.3569	.2424
		low	-5.3635*	1.18011	.001	-9.0316	-1.6955
		very low	-7.9067*	1.46291	.000	-12.4537	-3.3596
	moderate	very high	2.4506	1.83494	.775	-3.2528	8.1540
		high	3.5572	1.22245	.080	-.2424	7.3569
		low	-1.8063	1.13223	.637	-5.3255	1.7129
		very low	-4.3494	1.42458	.057	-8.7773	.0785
	low	very high	4.2569	1.80700	.239	-1.3597	9.8734
		high	5.3635*	1.18011	.001	1.6955	9.0316
		moderate	1.8063	1.13223	.637	-1.7129	5.3255
		very low	-2.5431	1.38841	.502	-6.8586	1.7723
	very low	very high	6.8000*	2.00318	.024	.5737	13.0263
		high	7.9067*	1.46291	.000	3.3596	12.4537
		moderate	4.3494	1.42458	.057	-.0785	8.7773
		low	2.5431	1.38841	.502	-1.7723	6.8586

Based on observed means.
The error term is Mean Square(Error) = 40.127.

*. The mean difference is significant at the .05 level.

dass21t

Scheffe[a,b]

rs_cat	N	Subset 1	2	3
high	50	19.2400		
very high	15	19.4667		
moderate	58	28.4828	28.4828	
low	68		33.2353	33.2353
very low	30			42.4000
Sig.		.178	.794	.185

Means for groups in homogeneous subsets are displayed.
Based on observed means.
The error term is Mean Square(Error) = 221.025.

a. Uses Harmonic Mean Sample Size = 32.906.

b. Alpha = .05.

dass21s

Scheffe[a,b]

rs_cat	N	Subset 1	2
very high	15	7.3333	
high	50	7.5200	
moderate	58	9.4138	9.4138
low	68	11.7059	11.7059
very low	30		12.8000
Sig.		.111	.338

Means for groups in homogeneous subsets are displayed.
Based on observed means.
The error term is Mean Square(Error) = 41.312.

a. Uses Harmonic Mean Sample Size = 32.906.

b. Alpha = .05.

dass21a

Scheffe[a,b]

rs_cat	N	Subset 1	2	3	4
very high	15	3.0667			
high	50	3.7600	3.7600		
moderate	58		7.5517	7.5517	
low	68			8.2059	
very low	30				13.7333
Sig.		.992	.101	.994	1.000

Means for groups in homogeneous subsets are displayed.
Based on observed means.
The error term is Mean Square(Error) = 30.108.

a. Uses Harmonic Mean Sample Size = 32.906.

b. Alpha = .05.

dass21d

Scheffe[a,b]

rs_cat	N	Subset 1	2	3
high	50	7.9600		
very high	15	9.0667	9.0667	
moderate	58	11.5172	11.5172	11.5172
low	68		13.3235	13.3235
very low	30			15.8667
Sig.		.272	.119	.105

Means for groups in homogeneous subsets are displayed.
Based on observed means.
The error term is Mean Square(Error) = 40.127.

a. Uses Harmonic Mean Sample Size = 32.906.

b. Alpha = .05.

Descriptive Statistics

	rs_cat	Mean	Std. Deviation	N
psst	very high	16.6667	4.33699	15
	high	16.4200	5.86616	50
	moderate	19.9483	5.09014	58
	low	21.3382	3.92318	68
	very low	21.6667	2.57753	30
	Total	19.5882	5.05674	221
saet	very high	21.6667	3.43650	15
	high	20.1200	3.60634	50
	moderate	19.2759	3.59724	58
	low	18.0000	3.53659	68
	very low	18.0000	3.68595	30
	Total	19.0633	3.71918	221

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[d]
Intercept	Pillai's Trace	.972	3746.63[b]	2.000	215.000	.000	.972	7493.257	1.000
	Wilks' Lambda	.028	3746.63[b]	2.000	215.000	.000	.972	7493.257	1.000
	Hotelling's Trace	34.852	3746.63[b]	2.000	215.000	.000	.972	7493.257	1.000
	Roy's Largest Root	34.852	3746.63[b]	2.000	215.000	.000	.972	7493.257	1.000
rs_cat	Pillai's Trace	.242	7.444	8.000	432.000	.000	.121	59.551	1.000
	Wilks' Lambda	.760	7.895[b]	8.000	430.000	.000	.128	63.158	1.000
	Hotelling's Trace	.312	8.345	8.000	428.000	.000	.135	66.760	1.000
	Roy's Largest Root	.301	16.241[c]	4.000	216.000	.000	.231	64.963	1.000

a. Design: Intercept + rs_cat

b. Exact statistic

c. The statistic is an upper bound on F that yields a lower bound on the significance level.

d. Computed using alpha = .05

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[c]
Corrected Model	psst	975.284[a]	4	243.821	11.325	.000	.173	45.301	1.000
	saet	270.914[b]	4	67.728	5.277	.000	.089	21.109	.969
Intercept	psst	60702.98	1	60702.98	2819.603	.000	.929	2819.603	1.000
	saet	62002.66	1	62002.66	4831.028	.000	.957	4831.028	1.000
rs_cat	psst	975.284	4	243.821	11.325	.000	.173	45.301	1.000
	saet	270.914	4	67.728	5.277	.000	.089	21.109	.969
Error	psst	4650.245	216	21.529					
	saet	2772.200	216	12.834					
Total	psst	90423.00	221						
	saet	83357.00	221						
Corrected Total	psst	5625.529	220						
	saet	3043.113	220						

a. R Squared = .173 (Adjusted R Squared = .158)

b. R Squared = .089 (Adjusted R Squared = .072)

c. Computed using alpha = .05

Estimates

Dependent Variable	rs_cat	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
psst	very high	16.667	1.198	14.305	19.028
	high	16.420	.656	15.127	17.713
	moderate	19.948	.609	18.747	21.149
	low	21.338	.563	20.229	22.447
	very low	21.667	.847	19.997	23.336
saet	very high	21.667	.925	19.843	23.490
	high	20.120	.507	19.121	21.119
	moderate	19.276	.470	18.349	20.203
	low	18.000	.434	17.144	18.856
	very low	18.000	.654	16.711	19.289

Pairwise Comparisons

Dependent Variable	(I) rs_cat	(J) rs_cat	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b]	
						Lower Bound	Upper Bound
pss t	very high	high	.247	1.366	1.000	-3.627	4.121
		moderate	-3.282	1.344	.154	-7.094	.530
		low	-4.672*	1.324	.005	-8.425	-.918
		very low	-5.000*	1.467	.008	-9.161	-.839
	high	very high	-.247	1.366	1.000	-4.121	3.627
		moderate	-3.528*	.895	.001	-6.068	-.989
		low	-4.918*	.864	.000	-7.370	-2.467
		very low	-5.247*	1.072	.000	-8.286	-2.208
	moderate	very high	3.282	1.344	.154	-.530	7.094
		high	3.528*	.895	.001	.989	6.068
		low	-1.390	.829	.952	-3.742	.962
		very low	-1.718	1.043	1.000	-4.678	1.241
	low	very high	4.672*	1.324	.005	.918	8.425
		high	4.918*	.864	.000	2.467	7.370
		moderate	1.390	.829	.952	-.962	3.742
		very low	-.328	1.017	1.000	-3.213	2.556
	very low	very high	5.000*	1.467	.008	.839	9.161
		high	5.247*	1.072	.000	2.208	8.286
		moderate	1.718	1.043	1.000	-1.241	4.678
		low	.328	1.017	1.000	-2.556	3.213
sae t	very high	high	1.547	1.055	1.000	-1.445	4.538
		moderate	2.391	1.038	.222	-.552	5.334
		low	3.667*	1.022	.004	.768	6.565
		very low	3.667*	1.133	.014	.454	6.880
	high	very high	-1.547	1.055	1.000	-4.538	1.445
		moderate	.844	.691	1.000	-1.117	2.805
		low	2.120*	.667	.017	.227	4.013
		very low	2.120	.827	.111	-.226	4.466
	moderate	very high	-2.391	1.038	.222	-5.334	.552
		high	-.844	.691	1.000	-2.805	1.117
		low	1.276	.640	.476	-.540	3.092
		very low	1.276	.806	1.000	-1.009	3.561
	low	very high	-3.667*	1.022	.004	-6.565	-.768
		high	-2.120*	.667	.017	-4.013	-.227
		moderate	-1.276	.640	.476	-3.092	.540
		very low	.000	.785	1.000	-2.227	2.227
	very low	very high	-3.667*	1.133	.014	-6.880	-.454
		high	-2.120	.827	.111	-4.466	.226
		moderate	-1.276	.806	1.000	-3.561	1.009
		low	.000	.785	1.000	-2.227	2.227

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Bonferroni.

Multivariate Tests

	Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[c]
Pillai's trace	.242	7.444	8.000	432.000	.000	.121	59.551	1.000
Wilks' lambda	.760	7.895[a]	8.000	430.000	.000	.128	63.158	1.000
Hotelling's trace	.312	8.345	8.000	428.000	.000	.135	66.760	1.000
Roy's largest root	.301	16.241[b]	4.000	216.000	.000	.231	64.963	1.000

Each F tests the multivariate effect of rs_cat. These tests are based on the linearly independent pairwise comparisons among the estimated marginal means.

a. Exact statistic

b. The statistic is an upper bound on F that yields a lower bound on the significance level.

c. Computed using alpha = .05

Univariate Tests

Dependent Variable		Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
pss t	Contrast	975.284	4	243.821	11.325	.000	.173	45.301	1.000
	Error	4650.245	216	21.529					
sae t	Contrast	270.914	4	67.728	5.277	.000	.089	21.109	.969
	Error	2772.200	216	12.834					

The F tests the effect of rs_cat. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.

a. Computed using alpha = .05

```
Run MATRIX procedure:

*************** PROCESS Procedure for SPSS Version 3.3 ******************

          Written by Andrew F. Hayes, Ph.D.       www.afhayes.com
    Documentation available in Hayes (2018). www.guilford.com/p/hayes3

**************************************************************************
Model  : 6
    Y  : dass21_t
    X  : pss_pece
   M1  : rs_resil
   M2  : sae_sati

Covariates:
 hong     aus

Sample
Size:  236

**************************************************************************
OUTCOME VARIABLE:
 rs_resil

Model Summary
          R       R-sq        MSE          F        df1        df2
p
        .42        .18     274.52      16.83       3.00     232.00
.00

Model
              coeff         se          t          p       LLCI       ULCI
constant     163.98       5.08      32.27        .00     153.97     173.99
pss_pece      -1.31        .22      -5.94        .00      -1.74       -.87
hong          -9.13       3.03      -3.01        .00     -15.09      -3.16
aus           -3.89       2.74      -1.42        .16      -9.29       1.51

**************************************************************************
OUTCOME VARIABLE:
 sae_sati

Model Summary
          R       R-sq        MSE          F        df1        df2
p
        .41        .17      11.94      11.56       4.00     231.00
.00

Model
              coeff         se          t          p       LLCI       ULCI
constant      12.26       2.48       4.94        .00       7.37      17.15
pss_pece        .04        .05        .72        .47       -.06        .13
rs_resil        .05        .01       3.81        .00        .03        .08
hong          -2.58        .64      -4.01        .00      -3.85      -1.32
aus            -.25        .57       -.43        .67      -1.38        .89

**************************************************************************
OUTCOME VARIABLE:
 dass21_t
```

```
Model Summary
          R       R-sq        MSE          F        df1        df2
p
       .66        .43     162.68      34.69       5.00     230.00
.00

Model
              coeff         se          t          p       LLCI       ULCI
constant      43.07       9.64       4.47        .00      24.08      62.05
pss_pece       1.40        .18       7.67        .00       1.04       1.76
rs_resil       -.26        .05      -5.00        .00       -.36       -.16
sae_sati       -.12        .24       -.49        .62       -.60        .36
hong          -3.94       2.46      -1.60        .11      -8.78        .91
aus           -6.74       2.12      -3.18        .00     -10.92      -2.57

************************** TOTAL EFFECT MODEL ****************************
OUTCOME VARIABLE:
 dass21_t

Model Summary
          R       R-sq        MSE          F        df1        df2
p
       .60        .36     181.02      43.53       3.00     232.00
.00

Model
              coeff         se          t          p       LLCI       ULCI
constant      -2.18       4.13       -.53        .60     -10.31       5.95
pss_pece       1.74        .18       9.74        .00       1.39       2.10
hong          -1.19       2.46       -.48        .63      -6.04       3.65
aus           -5.68       2.23      -2.55        .01     -10.06      -1.29

************** TOTAL, DIRECT, AND INDIRECT EFFECTS OF X ON Y **************

Total effect of X on Y
     Effect         se          t          p       LLCI       ULCI
c_ps       c_cs
      1.74        .18       9.74        .00       1.39       2.10
.10        .54

Direct effect of X on Y
     Effect         se          t          p       LLCI       ULCI
c'_ps      c'_cs
      1.40        .18       7.67        .00       1.04       1.76
.08        .43

Indirect effect(s) of X on Y:
         Effect     BootSE   BootLLCI   BootULCI
TOTAL        .35        .09        .17        .54
Ind1         .34        .09        .17        .54
Ind2         .00        .02       -.05        .03
Ind3         .01        .02       -.03        .04
(C1)         .35        .09        .17        .54
(C2)         .33        .10        .15        .54
(C3)        -.01        .03       -.08        .05
```

```
Partially standardized indirect effect(s) of X on Y:
          Effect     BootSE   BootLLCI   BootULCI
TOTAL        .02        .01        .01        .03
Ind1         .02        .01        .01        .03
Ind2         .00        .00        .00        .00
Ind3         .00        .00        .00        .00
(C1)         .02        .01        .01        .03
(C2)         .02        .01        .01        .03
(C3)         .00        .00        .00        .00

Completely standardized indirect effect(s) of X on Y:
          Effect     BootSE   BootLLCI   BootULCI
TOTAL        .11        .03        .05        .17
Ind1         .11        .03        .05        .17
Ind2         .00        .01       -.01        .01
Ind3         .00        .01       -.01        .01
(C1)         .11        .03        .05        .17
(C2)         .10        .03        .05        .17
(C3)         .00        .01       -.03        .02

Specific indirect effect contrast definition(s):
(C1)          Ind1      minus   Ind2
(C2)          Ind1      minus   Ind3
(C3)          Ind2      minus   Ind3

Indirect effect key:
Ind1 pss_pece    ->    rs_resil    ->    dass21_t
Ind2 pss_pece    ->    sae_sati    ->    dass21_t
Ind3 pss_pece    ->    rs_resil    ->    sae_sati    ->    dass21_t

********** BOOTSTRAP RESULTS FOR REGRESSION MODEL PARAMETERS ************

OUTCOME VARIABLE:
 rs_resil

              Coeff   BootMean     BootSE   BootLLCI   BootULCI
constant     163.98     163.95       4.62     154.93     173.07
pss_pece      -1.31      -1.31        .18      -1.68       -.96
hong          -9.13      -9.13       3.06     -15.15      -3.12
aus           -3.89      -3.86       2.93      -9.73       2.02

----------

OUTCOME VARIABLE:
 sae_sati

              Coeff   BootMean     BootSE   BootLLCI   BootULCI
constant      12.26      12.27       2.28       7.84      16.72
pss_pece        .04        .03        .06       -.07        .14
rs_resil        .05        .05        .01        .03        .08
hong          -2.58      -2.60        .61      -3.78      -1.40
aus            -.25       -.27        .60      -1.43        .90

----------
```

```
OUTCOME VARIABLE:
 dass21_t

              Coeff   BootMean     BootSE   BootLLCI   BootULCI
constant      43.07      42.79      11.66      19.29      65.33
pss_pece       1.40       1.40        .20       1.01       1.80
rs_resil       -.26       -.26        .06       -.38       -.13
sae_sati       -.12       -.11        .26       -.61        .41
hong          -3.94      -3.90       2.63      -9.15       1.23
aus           -6.74      -6.80       2.06     -10.86      -2.72

************************ ANALYSIS NOTES AND ERRORS ************************

Level of confidence for all confidence intervals in output:
  95.0000

Number of bootstrap samples for percentile bootstrap confidence intervals:
  5000

NOTE: Variables names longer than eight characters can produce incorrect
output.
      Shorter variable names are recommended.

------ END MATRIX -----
```

```
Run MATRIX procedure:

*************** PROCESS Procedure for SPSS Version 3.3 ******************

          Written by Andrew F. Hayes, Ph.D.       www.afhayes.com
    Documentation available in Hayes (2018). www.guilford.com/p/hayes3

**************************************************************************
Model  : 6
    Y  : dass_s_t
    X  : pss_pece
   M1  : rs_resil
   M2  : sae_sati

Covariates:
 hong     aus

Sample
Size:  236

**************************************************************************
OUTCOME VARIABLE:
 rs_resil

Model Summary
          R       R-sq        MSE          F        df1        df2
p
        .42        .18     274.52      16.83       3.00     232.00
.00

Model
              coeff         se          t          p       LLCI       ULCI
constant     163.98       5.08      32.27        .00     153.97     173.99
pss_pece      -1.31        .22      -5.94        .00      -1.74       -.87
hong          -9.13       3.03      -3.01        .00     -15.09      -3.16
aus           -3.89       2.74      -1.42        .16      -9.29       1.51

**************************************************************************
OUTCOME VARIABLE:
 sae_sati

Model Summary
          R       R-sq        MSE          F        df1        df2
p
        .41        .17      11.94      11.56       4.00     231.00
.00

Model
              coeff         se          t          p       LLCI       ULCI
constant      12.26       2.48       4.94        .00       7.37      17.15
pss_pece        .04        .05        .72        .47       -.06        .13
rs_resil        .05        .01       3.81        .00        .03        .08
hong          -2.58        .64      -4.01        .00      -3.85      -1.32
aus            -.25        .57       -.43        .67      -1.38        .89

**************************************************************************
OUTCOME VARIABLE:
 dass_s_t

Model Summary
```

```
          R       R-sq        MSE          F        df1        df2
p
       .57        .32      30.62      21.69       5.00     230.00
.00

Model
              coeff         se          t          p       LLCI       ULCI
constant       1.92       4.18        .46        .65      -6.32      10.15
pss_pece        .61        .08       7.69        .00        .45        .76
rs_resil       -.05        .02      -2.12        .04       -.09        .00
sae_sati       -.04        .11       -.39        .70       -.25        .17
hong           2.62       1.07       2.45        .01        .52       4.72
aus            5.58        .92       6.06        .00       3.76       7.39

************************** TOTAL EFFECT MODEL ****************************
OUTCOME VARIABLE:
 dass_s_t

Model Summary
          R       R-sq        MSE          F        df1        df2
p
       .55        .30      31.07      33.87       3.00     232.00
.00

Model
              coeff         se          t          p       LLCI       ULCI
constant      -6.80       1.71      -3.98        .00     -10.17      -3.43
pss_pece        .67        .07       9.07        .00        .53        .82
hong           3.18       1.02       3.12        .00       1.17       5.19
aus            5.78        .92       6.27        .00       3.97       7.60

************** TOTAL, DIRECT, AND INDIRECT EFFECTS OF X ON Y **************

Total effect of X on Y
     Effect         se          t          p       LLCI       ULCI
c_ps       c_cs
       .67        .07       9.07        .00        .53        .82
.10        .52

Direct effect of X on Y
     Effect         se          t          p       LLCI       ULCI
c'_ps      c'_cs
       .61        .08       7.69        .00        .45        .76
.09        .47

Indirect effect(s) of X on Y:
          Effect     BootSE   BootLLCI   BootULCI
TOTAL        .06        .04        .00        .13
Ind1         .06        .04       -.01        .14
Ind2         .00        .01       -.02        .01
Ind3         .00        .01       -.01        .02
(C1)         .06        .04        .00        .14
(C2)         .06        .04       -.02        .14
(C3)         .00        .01       -.04        .02

Partially standardized indirect effect(s) of X on Y:
          Effect     BootSE   BootLLCI   BootULCI
TOTAL        .01        .01        .00        .02
Ind1         .01        .01        .00        .02
Ind2         .00        .00        .00        .00
Ind3         .00        .00        .00        .00
```

```
(C1)         .01        .01        .00        .02
(C2)         .01        .01        .00        .02
(C3)         .00        .00       -.01        .00

Completely standardized indirect effect(s) of X on Y:
          Effect     BootSE   BootLLCI   BootULCI
TOTAL        .05        .03        .00        .10
Ind1         .05        .03       -.01        .10
Ind2         .00        .01       -.02        .01
Ind3         .00        .01       -.01        .01
(C1)         .05        .03        .00        .10
(C2)         .05        .03       -.01        .11
(C3)         .00        .01       -.03        .02

Specific indirect effect contrast definition(s):
(C1)          Ind1      minus   Ind2
(C2)          Ind1      minus   Ind3
(C3)          Ind2      minus   Ind3

Indirect effect key:
Ind1 pss_pece    ->    rs_resil    ->    dass_s_t
Ind2 pss_pece    ->    sae_sati    ->    dass_s_t
Ind3 pss_pece    ->    rs_resil    ->    sae_sati    ->    dass_s_t

********** BOOTSTRAP RESULTS FOR REGRESSION MODEL PARAMETERS ************

OUTCOME VARIABLE:
 rs_resil

              Coeff   BootMean     BootSE   BootLLCI   BootULCI
constant     163.98     163.93       4.68     154.94     173.21
pss_pece      -1.31      -1.31        .19      -1.68       -.95
hong          -9.13      -9.07       3.10     -15.21      -2.98
aus           -3.89      -3.81       2.96      -9.79       1.82

----------

OUTCOME VARIABLE:
 sae_sati

              Coeff   BootMean     BootSE   BootLLCI   BootULCI
constant      12.26      12.18       2.25       7.83      16.65
pss_pece        .04        .04        .05       -.07        .14
rs_resil        .05        .05        .01        .03        .08
hong          -2.58      -2.59        .61      -3.77      -1.39
aus            -.25       -.26        .59      -1.40        .90

----------

OUTCOME VARIABLE:
 dass_s_t

              Coeff   BootMean     BootSE   BootLLCI   BootULCI
constant       1.92       1.82       4.82      -7.69      11.02
pss_pece        .61        .61        .08        .45        .77
rs_resil       -.05       -.05        .03       -.10        .00
sae_sati       -.04       -.03        .12       -.26        .19
hong           2.62       2.65       1.13        .42       4.82
aus            5.58       5.59        .88       3.82       7.24

*********************** ANALYSIS NOTES AND ERRORS ************************
```

```
Level of confidence for all confidence intervals in output:
  95.0000

Number of bootstrap samples for percentile bootstrap confidence intervals:
  5000

NOTE: Variables names longer than eight characters can produce incorrect
output.
      Shorter variable names are recommended.

------ END MATRIX -----
```

```
Run MATRIX procedure:

*************** PROCESS Procedure for SPSS Version 3.3 ******************

          Written by Andrew F. Hayes, Ph.D.       www.afhayes.com
    Documentation available in Hayes (2018). www.guilford.com/p/hayes3

**************************************************************************
Model  : 6
    Y  : dass_a_t
    X  : pss_pece
   M1  : rs_resil
   M2  : sae_sati

Covariates:
 hong     aus

Sample
Size:  236

**************************************************************************
OUTCOME VARIABLE:
 rs_resil

Model Summary
          R       R-sq        MSE          F        df1        df2
p
        .42        .18     274.52      16.83       3.00     232.00
.00

Model
              coeff         se          t          p       LLCI       ULCI
constant     163.98       5.08      32.27        .00     153.97     173.99
pss_pece      -1.31        .22      -5.94        .00      -1.74       -.87
hong          -9.13       3.03      -3.01        .00     -15.09      -3.16
aus           -3.89       2.74      -1.42        .16      -9.29       1.51

**************************************************************************
OUTCOME VARIABLE:
 sae_sati

Model Summary
          R       R-sq        MSE          F        df1        df2
p
        .41        .17      11.94      11.56       4.00     231.00
.00

Model
              coeff         se          t          p       LLCI       ULCI
constant      12.26       2.48       4.94        .00       7.37      17.15
pss_pece        .04        .05        .72        .47       -.06        .13
rs_resil        .05        .01       3.81        .00        .03        .08
hong          -2.58        .64      -4.01        .00      -3.85      -1.32
aus            -.25        .57       -.43        .67      -1.38        .89

**************************************************************************
OUTCOME VARIABLE:
 dass_a_t

Model Summary
```

```
          R       R-sq        MSE          F        df1        df2
p
       .58        .33      26.01      22.95       5.00     230.00
.00

Model
              coeff         se          t          p       LLCI       ULCI
constant      20.58       3.85       5.34        .00      12.99      28.17
pss_pece        .35        .07       4.81        .00        .21        .49
rs_resil       -.13        .02      -6.42        .00       -.17       -.09
sae_sati       -.10        .10      -1.06        .29       -.29        .09
hong           -.93        .98       -.95        .34      -2.87       1.00
aus            -.03        .85       -.03        .97      -1.70       1.64

************************** TOTAL EFFECT MODEL ****************************
OUTCOME VARIABLE:
 dass_a_t

Model Summary
          R       R-sq        MSE          F        df1        df2
p
       .44        .19      31.23      18.37       3.00     232.00
.00

Model
              coeff         se          t          p       LLCI       ULCI
constant      -3.51       1.71      -2.05        .04      -6.89       -.14
pss_pece        .53        .07       7.12        .00        .38        .68
hong            .60       1.02        .59        .56      -1.41       2.62
aus             .54        .92        .58        .56      -1.28       2.36

************** TOTAL, DIRECT, AND INDIRECT EFFECTS OF X ON Y **************

Total effect of X on Y
     Effect         se          t          p       LLCI       ULCI
c_ps       c_cs
       .53        .07       7.12        .00        .38        .68
.09        .44

Direct effect of X on Y
     Effect         se          t          p       LLCI       ULCI
c'_ps      c'_cs
       .35        .07       4.81        .00        .21        .49
.06        .29

Indirect effect(s) of X on Y:
          Effect     BootSE   BootLLCI   BootULCI
TOTAL        .18        .04        .10        .27
Ind1         .18        .04        .10        .26
Ind2         .00        .01       -.02        .02
Ind3         .01        .01       -.01        .02
(C1)         .18        .04        .10        .27
(C2)         .17        .05        .09        .27
(C3)        -.01        .02       -.04        .02

Partially standardized indirect effect(s) of X on Y:
          Effect     BootSE   BootLLCI   BootULCI
TOTAL        .03        .01        .02        .04
Ind1         .03        .01        .02        .04
Ind2         .00        .00        .00        .00
Ind3         .00        .00        .00        .00
```

```
(C1)         .03        .01        .02        .04
(C2)         .03        .01        .01        .04
(C3)         .00        .00       -.01        .00

Completely standardized indirect effect(s) of X on Y:
          Effect     BootSE   BootLLCI   BootULCI
TOTAL        .15        .03        .09        .22
Ind1         .15        .03        .08        .22
Ind2         .00        .01       -.02        .01
Ind3         .01        .01       -.01        .02
(C1)         .15        .03        .08        .22
(C2)         .14        .04        .08        .22
(C3)        -.01        .01       -.04        .02

Specific indirect effect contrast definition(s):
(C1)          Ind1      minus   Ind2
(C2)          Ind1      minus   Ind3
(C3)          Ind2      minus   Ind3

Indirect effect key:
Ind1 pss_pece    ->    rs_resil    ->    dass_a_t
Ind2 pss_pece    ->    sae_sati    ->    dass_a_t
Ind3 pss_pece    ->    rs_resil    ->    sae_sati    ->    dass_a_t

********** BOOTSTRAP RESULTS FOR REGRESSION MODEL PARAMETERS ************

OUTCOME VARIABLE:
 rs_resil

              Coeff   BootMean     BootSE   BootLLCI   BootULCI
constant     163.98     164.02       4.58     154.94     172.76
pss_pece      -1.31      -1.31        .18      -1.67       -.97
hong          -9.13      -9.10       3.10     -15.10      -3.00
aus           -3.89      -3.87       2.98      -9.68       2.00

----------

OUTCOME VARIABLE:
 sae_sati

              Coeff   BootMean     BootSE   BootLLCI   BootULCI
constant      12.26      12.23       2.29       7.68      16.55
pss_pece        .04        .04        .06       -.07        .14
rs_resil        .05        .05        .01        .03        .08
hong          -2.58      -2.57        .62      -3.80      -1.32
aus            -.25       -.24        .60      -1.42        .95

----------

OUTCOME VARIABLE:
 dass_a_t

              Coeff   BootMean     BootSE   BootLLCI   BootULCI
constant      20.58      20.56       4.39      11.64      28.77
pss_pece        .35        .35        .08        .21        .50
rs_resil       -.13       -.13        .03       -.18       -.08
sae_sati       -.10       -.10        .12       -.34        .13
hong           -.93       -.90       1.02      -2.94       1.05
aus            -.03       -.02        .82      -1.63       1.58

********************** ANALYSIS NOTES AND ERRORS ************************
```

```
Level of confidence for all confidence intervals in output:
  95.0000

Number of bootstrap samples for percentile bootstrap confidence intervals:
  5000

NOTE: Variables names longer than eight characters can produce incorrect
output.
      Shorter variable names are recommended.

------ END MATRIX -----
```

```
Run MATRIX procedure:

*************** PROCESS Procedure for SPSS Version 3.3 ******************

          Written by Andrew F. Hayes, Ph.D.       www.afhayes.com
    Documentation available in Hayes (2018). www.guilford.com/p/hayes3

**************************************************************************
Model  : 6
    Y  : dass_d_t
    X  : pss_pece
   M1  : rs_resil
   M2  : sae_sati

Covariates:
 hong     aus

Sample
Size:  236

**************************************************************************
OUTCOME VARIABLE:
 rs_resil

Model Summary
          R       R-sq        MSE          F        df1        df2
p
        .42        .18     274.52      16.83       3.00     232.00
.00

Model
              coeff         se          t          p       LLCI       ULCI
constant     163.98       5.08      32.27        .00     153.97     173.99
pss_pece      -1.31        .22      -5.94        .00      -1.74       -.87
hong          -9.13       3.03      -3.01        .00     -15.09      -3.16
aus           -3.89       2.74      -1.42        .16      -9.29       1.51

**************************************************************************
OUTCOME VARIABLE:
 sae_sati

Model Summary
          R       R-sq        MSE          F        df1        df2
p
        .41        .17      11.94      11.56       4.00     231.00
.00

Model
              coeff         se          t          p       LLCI       ULCI
constant      12.26       2.48       4.94        .00       7.37      17.15
pss_pece        .04        .05        .72        .47       -.06        .13
rs_resil        .05        .01       3.81        .00        .03        .08
hong          -2.58        .64      -4.01        .00      -3.85      -1.32
aus            -.25        .57       -.43        .67      -1.38        .89

**************************************************************************
OUTCOME VARIABLE:
 dass_d_t

Model Summary
```

```
          R       R-sq        MSE          F        df1        df2
p
       .75        .56      34.29      58.31       5.00     230.00
.00

Model
              coeff         se          t          p       LLCI       ULCI
constant      20.57       4.42       4.65        .00      11.86      29.29
pss_pece        .44        .08       5.24        .00        .27        .60
rs_resil       -.08        .02      -3.30        .00       -.13       -.03
sae_sati        .02        .11        .22        .82       -.19        .24
hong          -5.62       1.13      -4.98        .00      -7.84      -3.40
aus          -12.29        .97     -12.63        .00     -14.21     -10.37

************************** TOTAL EFFECT MODEL ****************************
OUTCOME VARIABLE:
 dass_d_t

Model Summary
          R       R-sq        MSE          F        df1        df2
p
       .73        .54      35.66      89.84       3.00     232.00
.00

Model
              coeff         se          t          p       LLCI       ULCI
constant       8.14       1.83       4.44        .00       4.53      11.75
pss_pece        .54        .08       6.81        .00        .38        .70
hong          -4.98       1.09      -4.56        .00      -7.13      -2.83
aus          -12.00        .99     -12.15        .00     -13.94     -10.05

************** TOTAL, DIRECT, AND INDIRECT EFFECTS OF X ON Y **************

Total effect of X on Y
     Effect         se          t          p       LLCI       ULCI
c_ps       c_cs
       .54        .08       6.81        .00        .38        .70
.06        .32

Direct effect of X on Y
     Effect         se          t          p       LLCI       ULCI
c'_ps      c'_cs
       .44        .08       5.24        .00        .27        .60
.05        .26

Indirect effect(s) of X on Y:
         Effect     BootSE   BootLLCI   BootULCI
TOTAL       .10        .04        .03        .18
Ind1        .10        .04        .03        .18
Ind2        .00        .01       -.02        .01
Ind3        .00        .01       -.02        .01
(C1)        .10        .04        .03        .18
(C2)        .11        .04        .03        .19
(C3)        .00        .01       -.02        .03

Partially standardized indirect effect(s) of X on Y:
         Effect     BootSE   BootLLCI   BootULCI
TOTAL       .01        .00        .00        .02
Ind1        .01        .00        .00        .02
Ind2        .00        .00        .00        .00
Ind3        .00        .00        .00        .00
```

```
(C1)          .01         .00         .00         .02
(C2)          .01         .00         .00         .02
(C3)          .00         .00         .00         .00

Completely standardized indirect effect(s) of X on Y:
          Effect     BootSE   BootLLCI   BootULCI
TOTAL        .06        .02        .02        .11
Ind1         .06        .02        .02        .11
Ind2         .00        .00       -.01        .01
Ind3         .00        .00       -.01        .01
(C1)         .06        .02        .02        .11
(C2)         .06        .02        .02        .11
(C3)         .00        .01       -.01        .02

Specific indirect effect contrast definition(s):
(C1)          Ind1      minus   Ind2
(C2)          Ind1      minus   Ind3
(C3)          Ind2      minus   Ind3

Indirect effect key:
Ind1 pss_pece    ->    rs_resil    ->    dass_d_t
Ind2 pss_pece    ->    sae_sati    ->    dass_d_t
Ind3 pss_pece    ->    rs_resil    ->    sae_sati    ->    dass_d_t

********** BOOTSTRAP RESULTS FOR REGRESSION MODEL PARAMETERS ************

OUTCOME VARIABLE:
 rs_resil

              Coeff   BootMean     BootSE   BootLLCI   BootULCI
constant     163.98     164.12       4.61     154.98     173.36
pss_pece      -1.31      -1.32        .18      -1.69       -.96
hong          -9.13      -9.19       3.08     -15.38      -3.28
aus           -3.89      -3.96       2.96      -9.86       1.89

----------

OUTCOME VARIABLE:
 sae_sati

              Coeff   BootMean     BootSE   BootLLCI   BootULCI
constant      12.26      12.27       2.29       7.75      16.88
pss_pece        .04        .03        .06       -.07        .14
rs_resil        .05        .05        .01        .03        .08
hong          -2.58      -2.58        .61      -3.73      -1.34
aus            -.25       -.25        .59      -1.41        .94

----------

OUTCOME VARIABLE:
 dass_d_t

              Coeff   BootMean     BootSE   BootLLCI   BootULCI
constant      20.57      20.43       5.10      10.61      30.35
pss_pece        .44        .44        .09        .26        .62
rs_resil       -.08       -.08        .03       -.13       -.02
sae_sati        .02        .03        .10       -.17        .23
hong          -5.62      -5.62       1.21      -7.93      -3.24
aus          -12.29     -12.30        .97     -14.19     -10.39

*********************** ANALYSIS NOTES AND ERRORS ************************
```

```
Level of confidence for all confidence intervals in output:
  95.0000

Number of bootstrap samples for percentile bootstrap confidence intervals:
  5000

NOTE: Variables names longer than eight characters can produce incorrect
output.
      Shorter variable names are recommended.

------ END MATRIX -----
```

Study 2 Data Output

Descriptive Statistics

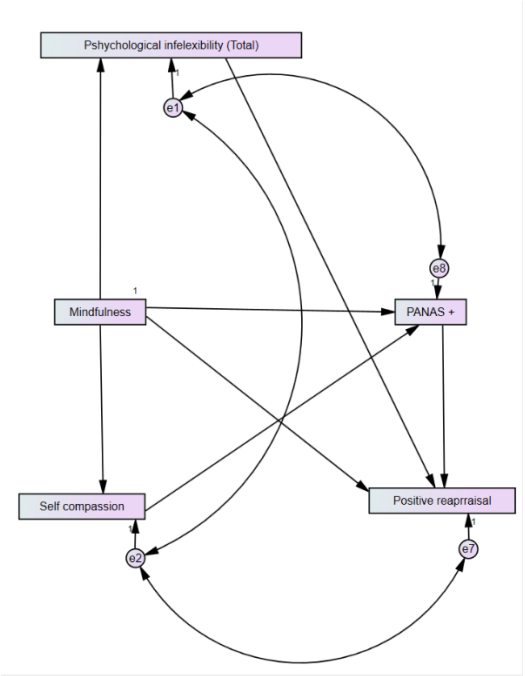
	N	Minimum	Maximum	Mean	Std. Deviation	Variance
FFMQ (Observe)	420	11.00	40.00	25.6048	5.27985	27.877
FFMQ (Describe)	420	8.00	40.00	26.4357	5.77858	33.392
FFMQ(Awareness)	420	8.00	39.00	24.4262	5.83355	34.030
FFMQ (Non Judgement)	420	8.00	40.00	25.6643	6.37748	40.672
FFMQ (NonReactive)	420	7.00	31.00	20.8214	4.33766	18.815
FFMQ (Total)	420	55.00	171.00	122.9524	17.48160	305.606
Resiliance (Total)	420	35.00	98.00	74.8976	13.25359	175.658
Pshychological infelexibility (Total)	420	7.00	49.00	22.2000	8.63461	74.557
Perceived stress (Total)	420	10.00	48.00	28.3738	6.49882	42.235
PANAS +	420	12.00	51.00	32.6262	8.26389	68.292
PANAS -	420	10.00	433.00	22.2381	21.41499	458.602
DAS (Stress)	420	7.00	28.00	13.9786	4.41812	19.520
DAS (Anxiety)	420	6.00	24.00	9.5595	3.46738	12.023
DAS (Depression)	420	7.00	28.00	11.1381	3.91496	15.327
DAS (Total)	420	20.00	80.00	34.6762	10.17742	103.580
Self compassion	420	36.00	128.00	77.8357	17.04435	290.510
Positive reaprraisal	420	4.00	20.00	13.4429	4.16991	17.388
Satisfaction with AcademicExperience	420	5.00	25.00	19.5714	3.47540	12.078
Self Kindess	420	5.00	25.00	14.5881	3.69342	13.641
Self Judgement	420	5.00	25.00	15.6524	4.18864	17.545
Common Humanity	420	4.00	20.00	12.5262	3.23861	10.489
Isolation	420	4.00	20.00	12.1429	3.80159	14.452
Mindfulness	420	5.00	20.00	12.8333	2.86379	8.201
OverIdentified	420	4.00	20.00	12.3167	3.84201	14.761
Valid N (listwise)	420					

Correlations

		FFMQ (Total)	Resiliance (Total)	Pshychological infelexibility (Total)	Perceived stress (Total)	PANAS +	PANAS -	DAS (Total)	Self compassion	Positive reaprraisal	Satisfaction with AcademicExperience	Self Kindess	Self Judgement	Common Humanity	Isolation	Mindfulness	OverIdentified
FFMQ (Total)	Pearson Correlation	1	.616**	-.620**	-.640**	.504**	-.171**	-.515**	.651**	.493**	.176**	.506**	-.501**	.451**	-.521**	.579**	-.528**
	Sig. (2-tailed)		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420
Resiliance (Total)	Pearson Correlation	.616**	1	-.573**	-.528**	.611**	-.175**	-.466**	.551**	.501**	.351**	.451**	-.371**	.493**	-.430**	.563**	-.347**
	Sig. (2-tailed)	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420
Pshychological infelexibility (Total)	Pearson Correlation	-.620**	-.573**	1	.669**	-.450**	.221**	.626**	-.676**	-.370**	-.197**	-.443**	.619**	-.377**	.645**	-.448**	.607**
	Sig. (2-tailed)	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420
Perceived stress (Total)	Pearson Correlation	-.640**	-.528**	.669**	1	-.547**	.269**	.698**	-.690**	-.440**	-.165**	-.469**	.619**	-.398**	.588**	-.529**	.627**
	Sig. (2-tailed)	.000	.000	.000		.000	.000	.000	.000	.000	.001	.000	.000	.000	.000	.000	.000
	N	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420
PANAS +	Pearson Correlation	.504**	.611**	-.450**	-.547**	1	-.094	-.401**	.422**	.418**	.175**	.338**	-.361**	.308**	-.351**	.366**	-.276**
	Sig. (2-tailed)	.000	.000	.000	.000		.055	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420
PANAS -	Pearson Correlation	-.171**	-.175**	.221**	.269**	-.094	1	.302**	-.213**	-.140**	-.134**	-.121*	.191**	-.138**	.215**	-.114*	.205**
	Sig. (2-tailed)	.000	.000	.000	.000	.055		.000	.000	.004	.006	.013	.000	.005	.000	.020	.000
	N	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420
DAS (Total)	Pearson Correlation	-.515**	-.466**	.626**	.698**	-.401**	.302**	1	-.597**	-.333**	-.237**	-.374**	.560**	-.333**	.530**	-.404**	.571**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420
Self compassion	Pearson Correlation	.651**	.551**	-.676**	-.690**	.422**	-.213**	-.597**	1	.579**	.169**	.787**	-.841**	.690**	-.811**	.755**	-.816**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000		.000	.001	.000	.000	.000	.000	.000	.000
	N	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420
Positive reaprraisal	Pearson Correlation	.493**	.501**	-.370**	-.440**	.418**	-.140**	-.333**	.579**	1	.239**	.491**	-.361**	.490**	-.419**	.598**	-.429**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.004	.000	.000		.000	.000	.000	.000	.000	.000	.000
	N	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420
Satisfaction with AcademicExperience	Pearson Correlation	.176**	.351**	-.197**	-.165**	.175**	-.134**	-.237**	.169**	.239**	1	.177**	-.109*	.140**	-.144**	.160**	-.080
	Sig. (2-tailed)	.000	.000	.000	.001	.000	.006	.000	.001	.000		.000	.025	.004	.003	.001	.101
	N	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420
Self Kindess	Pearson Correlation	.506**	.451**	-.443**	-.469**	.338**	-.121*	-.374**	.787**	.491**	.177**	1	-.582**	.642**	-.439**	.638**	-.445**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.013	.000	.000	.000	.000		.000	.000	.000	.000	.000
	N	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420
Self Judgement	Pearson Correlation	-.501**	-.371**	.619**	.619**	-.361**	.191**	.560**	-.841**	-.361**	-.109*	-.582**	1	-.363**	.713**	-.447**	.736**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.025	.000		.000	.000	.000	.000
	N	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420
Common Humanity	Pearson Correlation	.451**	.493**	-.377**	-.398**	.308**	-.138**	-.333**	.690**	.490**	.140**	.642**	-.363**	1	-.406**	.623**	-.338**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.005	.000	.000	.000	.004	.000	.000		.000	.000	.000
	N	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420
Isolation	Pearson Correlation	-.521**	-.430**	.645**	.588**	-.351**	.215**	.530**	-.811**	-.419**	-.144**	-.439**	.713**	-.406**	1	-.459**	.725**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.003	.000	.000	.000		.000	.000
	N	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420
Mindfulness	Pearson Correlation	.579**	.563**	-.448**	-.529**	.366**	-.114*	-.404**	.755**	.598**	.160**	.638**	-.447**	.623**	-.459**	1	-.523**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.020	.000	.000	.000	.001	.000	.000	.000	.000		.000
	N	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420
OverIdentified	Pearson Correlation	-.528**	-.347**	.607**	.627**	-.276**	.205**	.571**	-.816**	-.429**	-.080	-.445**	.736**	-.338**	.725**	-.523**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.101	.000	.000	.000	.000	.000	
	N	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).



Notes for Model (Default model)

Computation of degrees of freedom (Default model)

Number of distinct sample moments: 15
Number of distinct parameters to be estimated: 14
Degrees of freedom (15 - 14): 1

Result (Default model)

Minimum was achieved
Chi-square = .001
Degrees of freedom = 1
Probability level = .972

Notes for Model (Default model)

Computation of degrees of freedom (Default model)

Number of distinct sample moments: 15
Number of distinct parameters to be estimated: 14
Degrees of freedom (15 - 14): 1

Result (Default model)

Minimum was achieved
Chi-square = .001
Degrees of freedom = 1
Probability level = .972

Variances: (Group number 1 - Default model)

	Estimate	S.E.	C.R.	P	Label
ZMindfulness_Subscale_Total	1.000				
e2	.429	.030	14.474	***	par_11
e1	.797	.055	14.474	***	par_12
e8	.814	.056	14.474	***	par_13
e7	.594	.041	14.450	***	par_14

Squared Multiple Correlations: (Group number 1 - Default model)

	Estimate
ZSC	.570
ZPANAS_P	.184
ZPI_Total	.201
ZPR	.405

Matrices (Group number 1 - Default model)

Total Effects (Group number 1 - Default model)

	ZMindfulness_Subscale_Total	ZSC	ZPANAS_P	ZPI_Total
ZSC	.755	.000	.000	.000
ZPANAS_P	.366	.340	.000	.000
ZPI_Total	-.448	.000	.000	.000
ZPR	.598	.060	.178	-.064

Standardized Total Effects (Group number 1 - Default model)

	ZMindfulness_Subscale_Total	ZSC	ZPANAS_P	ZPI_Total
ZSC	.755	.000	.000	.000
ZPANAS_P	.366	.340	.000	.000
ZPI_Total	-.449	.000	.000	.000
ZPR	.598	.060	.178	-.064

Direct Effects (Group number 1 - Default model)

	ZMindfulness_Subscale_Total	ZSC	ZPANAS_P	ZPI_Total
ZSC	.755	.000	.000	.000
ZPANAS_P	.109	.340	.000	.000
ZPI_Total	-.448	.000	.000	.000
ZPR	.504	.000	.178	-.064

Standardized Direct Effects (Group number 1 - Default model)

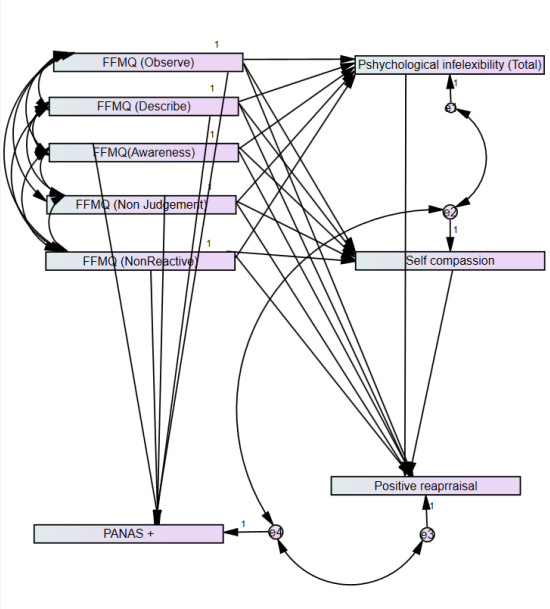
	ZMindfulness_Subscale_Total	ZSC	ZPANAS_P	ZPI_Total
ZSC	.755	.000	.000	.000
ZPANAS_P	.110	.340	.000	.000
ZPI_Total	-.449	.000	.000	.000
ZPR	.504	.000	.178	-.064

Indirect Effects (Group number 1 - Default model)

	ZMindfulness_Subscale_Total	ZSC	ZPANAS_P	ZPI_Total
ZSC	.000	.000	.000	.000
ZPANAS_P	.257	.000	.000	.000
ZPI_Total	.000	.000	.000	.000
ZPR	.094	.060	.000	.000

Standardized Indirect Effects (Group number 1 - Default model)

	ZMindfulness_Subscale_Total	ZSC	ZPANAS_P	ZPI_Total
ZSC	.000	.000	.000	.000
ZPANAS_P	.257	.000	.000	.000
ZPI_Total	.000	.000	.000	.000
ZPR	.094	.060	.000	.000



Notes for Model (Default model)

Computation of degrees of freedom (Default model)

Number of distinct sample moments: 45
Number of distinct parameters to be estimated: 39
Degrees of freedom (45 - 39): 6

Result (Default model)

Minimum was achieved
Chi-square = 27.000
Degrees of freedom = 6
Probability level = .000

Estimates (Group number 1 - Default model)

Scalar Estimates (Group number 1 - Default model)

Maximum Likelihood Estimates

Regression Weights: (Group number 1 - Default model)

			Estimate	S.E.	C.R.	P	Label
ZPI_Total	<---	ZFFMQ_Observe	.047	.038	1.229	.219	par_1
ZPI_Total	<---	ZFFMQ_Describe	-.147	.039	-3.719	***	par_2
ZPI_Total	<---	ZFFMQ_Awareness	-.166	.040	-4.145	***	par_3
ZPI_Total	<---	ZFFMQ_NonJudgement	-.478	.041	-11.781	***	par_4
ZPI_Total	<---	ZFFMQ_NonReactive	-.177	.039	-4.536	***	par_5
ZSC	<---	ZFFMQ_NonReactive	.437	.037	11.773	***	par_10
ZSC	<---	ZFFMQ_NonJudgement	.381	.039	9.857	***	par_11
ZSC	<---	ZFFMQ_Awareness	.132	.038	3.468	***	par_12
ZSC	<---	ZFFMQ_Describe	.055	.038	1.471	.141	par_13
ZSC	<---	ZFFMQ_Observe	.008	.036	.209	.835	par_14
ZPR	<---	ZPI_Total	.087	.057	1.523	.128	par_6
ZPANAS_P	<---	ZFFMQ_Observe	.123	.046	2.671	.008	par_15
ZPR	<---	ZFFMQ_Awareness	.021	.045	.467	.640	par_20
ZPR	<---	ZFFMQ_Observe	.187	.042	4.427	***	par_21
ZPR	<---	ZSC	.493	.061	8.031	***	par_22
ZPANAS_P	<---	ZFFMQ_Describe	.243	.048	5.071	***	par_23
ZPANAS_P	<---	ZFFMQ_NonJudgement	.089	.049	1.816	.069	par_24
ZPANAS_P	<---	ZFFMQ_NonReactive	.073	.047	1.544	.122	par_25
ZPANAS_P	<---	ZFFMQ_Awareness	.246	.049	5.069	***	par_26
ZPR	<---	ZFFMQ_Describe	.060	.044	1.353	.176	par_27
ZPR	<---	ZFFMQ_NonJudgement	.032	.053	.595	.552	par_28
ZPR	<---	ZFFMQ_NonReactive	.098	.050	1.972	.049	par_29

Standardized Regression Weights: (Group number 1 - Default model)

			Estimate
ZPI_Total	<---	ZFFMQ_Observe	.047
ZPI_Total	<---	ZFFMQ_Describe	-.147
ZPI_Total	<---	ZFFMQ_Awareness	-.166
ZPI_Total	<---	ZFFMQ_NonJudgement	-.478
ZPI_Total	<---	ZFFMQ_NonReactive	-.177
ZSC	<---	ZFFMQ_NonReactive	.439
ZSC	<---	ZFFMQ_NonJudgement	.383
ZSC	<---	ZFFMQ_Awareness	.133
ZSC	<---	ZFFMQ_Describe	.056
ZSC	<---	ZFFMQ_Observe	.008
ZPR	<---	ZPI_Total	.088
ZPANAS_P	<---	ZFFMQ_Observe	.124
ZPR	<---	ZFFMQ_Awareness	.021
ZPR	<---	ZFFMQ_Observe	.188
ZPR	<---	ZSC	.492
ZPANAS_P	<---	ZFFMQ_Describe	.243
ZPANAS_P	<---	ZFFMQ_NonJudgement	.089
ZPANAS_P	<---	ZFFMQ_NonReactive	.073
ZPANAS_P	<---	ZFFMQ_Awareness	.246
ZPR	<---	ZFFMQ_Describe	.060
ZPR	<---	ZFFMQ_NonJudgement	.032
ZPR	<---	ZFFMQ_NonReactive	.098

Covariances: (Group number 1 - Default model)

			Estimate	S.E.	C.R.	P	Label
ZFFMQ_NonJudgement	<-->	ZFFMQ_NonReactive	.238	.045	5.339	***	par_16
ZFFMQ_Awareness	<-->	ZFFMQ_NonReactive	.176	.046	3.823	***	par_17
ZFFMQ_Describe	<-->	ZFFMQ_NonReactive	.322	.042	7.762	***	par_18
ZFFMQ_Observe	<-->	ZFFMQ_NonJudgement	-.057	.048	-1.188	.235	par_19
ZFFMQ_Observe	<-->	ZFFMQ_Awareness	.059	.048	1.226	.220	par_30
ZFFMQ_Describe	<-->	ZFFMQ_Awareness	.356	.040	8.903	***	par_31
ZFFMQ_Awareness	<-->	ZFFMQ_NonJudgement	.461	.035	13.202	***	par_32
ZFFMQ_Observe	<-->	ZFFMQ_Describe	.256	.044	5.815	***	par_33
ZFFMQ_Describe	<-->	ZFFMQ_NonJudgement	.311	.042	7.446	***	par_34
ZFFMQ_Observe	<-->	ZFFMQ_NonReactive	.357	.040	8.909	***	par_35
e1	<-->	e2	-.179	.025	-7.309	***	par_7
e3	<-->	e4	.140	.033	4.244	***	par_8
e4	<-->	e2	.068	.026	2.606	.009	par_9

Correlations: (Group number 1 - Default model)

			Estimate
ZFFMQ_NonJudgement	<-->	ZFFMQ_NonReactive	.238
ZFFMQ_Awareness	<-->	ZFFMQ_NonReactive	.176
ZFFMQ_Describe	<-->	ZFFMQ_NonReactive	.322
ZFFMQ_Observe	<-->	ZFFMQ_NonJudgement	-.057
ZFFMQ_Observe	<-->	ZFFMQ_Awareness	.059
ZFFMQ_Describe	<-->	ZFFMQ_Awareness	.356
ZFFMQ_Awareness	<-->	ZFFMQ_NonJudgement	.461
ZFFMQ_Observe	<-->	ZFFMQ_Describe	.256
ZFFMQ_Describe	<-->	ZFFMQ_NonJudgement	.311
ZFFMQ_Observe	<-->	ZFFMQ_NonReactive	.357
e1	<-->	e2	-.380
e3	<-->	e4	.210
e4	<-->	e2	.119

Variances: (Group number 1 - Default model)

	Estimate	S.E.	C.R.	P	Label
ZFFMQ_Observe	1.000				
ZFFMQ_Describe	1.000				
ZFFMQ_Awareness	1.000				
ZFFMQ_NonJudgement	1.000				
ZFFMQ_NonReactive	1.000				
e1	.495	.034	14.474	***	par_36
e2	.450	.031	14.504	***	par_37
e3	.608	.042	14.474	***	par_38
e4	.729	.050	14.474	***	par_39

Squared Multiple Correlations: (Group number 1 - Default model)

	Estimate
ZSC	.545
ZPI_Total	.504
ZPANAS_P	.270
ZPR	.387

Study 3 Data Output

Descriptive Statistics

	Group	Mean	Std. Deviation	N
PostFFMQ_Total	MARST	142.5333	26.11750	15
	Control	111.6667	11.71117	12
	Total	128.8148	25.87698	27
PostResilience_Total	MARST	82.3333	10.28638	15
	Control	67.1667	11.73831	12
	Total	75.5926	13.20041	27
PostPsychInflex_Total	MARST	16.9333	5.87326	15
	Control	28.9167	5.59965	12
	Total	22.2593	8.28619	27
PostPerceivedStress_Total	MARST	23.8667	4.95504	15
	Control	30.9167	4.99924	12
	Total	27.0000	6.04471	27
PostPANASPos_Total	MARST	32.8000	5.75946	15
	Control	28.8333	6.36515	12
	Total	31.0370	6.24796	27
PostSelfCom_Total	MARST	94.8667	13.96867	15
	Control	69.3333	17.56719	12
	Total	83.5185	20.06982	27
PostDass_Total	MARST	24.7333	2.63131	15
	Control	37.0000	7.51967	12
	Total	30.1852	8.13840	27
PostPosReap_Total	MARST	17.1333	2.85023	15
	Control	12.0833	5.21289	12
	Total	14.8889	4.73395	27

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[c]
Intercept	Pillai's Trace	.999	1776.912[b]	8.000	18.000	.000	.999	14215.300	1.000
	Wilks' Lambda	.001	1776.912[b]	8.000	18.000	.000	.999	14215.300	1.000
	Hotelling's Trace	789.739	1776.912[b]	8.000	18.000	.000	.999	14215.300	1.000
	Roy's Largest Root	789.739	1776.912[b]	8.000	18.000	.000	.999	14215.300	1.000
Group	Pillai's Trace	.725	5.918[b]	8.000	18.000	.001	.725	47.343	.992
	Wilks' Lambda	.275	5.918[b]	8.000	18.000	.001	.725	47.343	.992
	Hotelling's Trace	2.630	5.918[b]	8.000	18.000	.001	.725	47.343	.992
	Roy's Largest Root	2.630	5.918[b]	8.000	18.000	.001	.725	47.343	.992

a. Design: Intercept + Group

b. Exact statistic

c. Computed using alpha = .05

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[i]
Corrected Model	PostFFMQ_Total	6351.674[a]	1	6351.674	14.359	.001	.365	14.359	.954
	PostResilience_Total	1533.519[b]	1	1533.519	12.792	.001	.338	12.792	.930
	PostPsychInflex_Total	957.335[c]	1	957.335	28.910	.000	.536	28.910	.999
	PostPerceivedStress_Total	331.350[d]	1	331.350	13.390	.001	.349	13.390	.940
	PostPANASPos_Total	104.896[e]	1	104.896	2.882	.102	.103	2.882	.372
	PostSelfCom_Total	4346.341[f]	1	4346.341	17.736	.000	.415	17.736	.981
	PostDass_Total	1003.141[g]	1	1003.141	34.883	.000	.583	34.883	1.000
	PostPosReap_Total	170.017[h]	1	170.017	10.300	.004	.292	10.300	.869
Intercept	PostFFMQ_Total	430784.267	1	430784.267	973.885	.000	.975	973.885	1.000
	PostResilience_Total	149001.667	1	149001.667	1242.923	.000	.980	1242.923	1.000
	PostPsychInflex_Total	14014.817	1	14014.817	423.229	.000	.944	423.229	1.000
	PostPerceivedStress_Total	20008.091	1	20008.091	808.538	.000	.970	808.538	1.000
	PostPANASPos_Total	25324.452	1	25324.452	695.676	.000	.965	695.676	1.000
	PostSelfCom_Total	179744.267	1	179744.267	733.482	.000	.967	733.482	1.000
	PostDass_Total	25406.696	1	25406.696	883.486	.000	.972	883.486	1.000
	PostPosReap_Total	5690.757	1	5690.757	344.769	.000	.932	344.769	1.000
Group	PostFFMQ_Total	6351.674	1	6351.674	14.359	.001	.365	14.359	.954
	PostResilience_Total	1533.519	1	1533.519	12.792	.001	.338	12.792	.930
	PostPsychInflex_Total	957.335	1	957.335	28.910	.000	.536	28.910	.999
	PostPerceivedStress_Total	331.350	1	331.350	13.390	.001	.349	13.390	.940
	PostPANASPos_Total	104.896	1	104.896	2.882	.102	.103	2.882	.372
	PostSelfCom_Total	4346.341	1	4346.341	17.736	.000	.415	17.736	.981
	PostDass_Total	1003.141	1	1003.141	34.883	.000	.583	34.883	1.000
	PostPosReap_Total	170.017	1	170.017	10.300	.004	.292	10.300	.869
Error	PostFFMQ_Total	11058.400	25	442.336					
	PostResilience_Total	2997.000	25	119.880					
	PostPsychInflex_Total	827.850	25	33.114					
	PostPerceivedStress_Total	618.650	25	24.746					
	PostPANASPos_Total	910.067	25	36.403					
	PostSelfCom_Total	6126.400	25	245.056					
	PostDass_Total	718.933	25	28.757					
	PostPosReap_Total	412.650	25	16.506					
Total	PostFFMQ_Total	465428.000	27						
	PostResilience_Total	158815.000	27						
	PostPsychInflex_Total	15163.000	27						
	PostPerceivedStress_Total	20633.000	27						
	PostPANASPos_Total	27024.000	27						
	PostSelfCom_Total	198807.000	27						
	PostDass_Total	26323.000	27						
	PostPosReap_Total	6568.000	27						
Corrected Total	PostFFMQ_Total	17410.074	26						
	PostResilience_Total	4530.519	26						
	PostPsychInflex_Total	1785.185	26						
	PostPerceivedStress_Total	950.000	26						
	PostPANASPos_Total	1014.963	26						
	PostSelfCom_Total	10472.741	26						
	PostDass_Total	1722.074	26						
	PostPosReap_Total	582.667	26						

a. R Squared = .365 (Adjusted R Squared = .339)
b. R Squared = .338 (Adjusted R Squared = .312)
c. R Squared = .536 (Adjusted R Squared = .518)
d. R Squared = .349 (Adjusted R Squared = .323)
e. R Squared = .103 (Adjusted R Squared = .067)
f. R Squared = .415 (Adjusted R Squared = .392)
g. R Squared = .583 (Adjusted R Squared = .566)
h. R Squared = .292 (Adjusted R Squared = .263)
i. Computed using alpha = .05

Descriptive Statistics

	Group	Mean	Std. Deviation	N
FUFFMQ_Total	MARST	147.9333	18.60671	15
	Control	104.4167	10.62123	12
	Total	128.5926	26.82745	27
FUDass_Total	MARST	28.1333	5.47549	15
	Control	40.0833	7.94822	12
	Total	33.4444	8.91556	27
FUResilience_Total	MARST	82.2000	12.29518	15
	Control	62.4167	9.03989	12
	Total	73.4074	14.70808	27
FUPsychInflex_Total	MARST	15.2000	5.14365	15
	Control	30.7500	5.17204	12
	Total	22.1111	9.35757	27
FUPerceivedStress_Total	MARST	23.1333	6.63181	15
	Control	32.8333	3.32575	12
	Total	27.4444	7.24480	27
FUPANASPos_Total	MARST	33.0667	9.66190	15
	Control	26.6667	5.05125	12
	Total	30.2222	8.45956	27
FUSelfCom_Total	MARST	98.2667	15.44792	15
	Control	61.3333	18.74874	12
	Total	81.8519	25.03951	27
FUPosReap_Total	MARST	16.7333	4.47958	15
	Control	10.5833	4.46111	12
	Total	14.0000	5.37802	27

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[c]
Intercept	Pillai's Trace	.999	3745.310[b]	8.000	18.000	.000	.999	29962.477	1.000
	Wilks' Lambda	.001	3745.310[b]	8.000	18.000	.000	.999	29962.477	1.000
	Hotelling's Trace	1664.582	3745.310[b]	8.000	18.000	.000	.999	29962.477	1.000
	Roy's Largest Root	1664.582	3745.310[b]	8.000	18.000	.000	.999	29962.477	1.000
Group	Pillai's Trace	.848	12.522[b]	8.000	18.000	.000	.848	100.178	1.000
	Wilks' Lambda	.152	12.522[b]	8.000	18.000	.000	.848	100.178	1.000
	Hotelling's Trace	5.565	12.522[b]	8.000	18.000	.000	.848	100.178	1.000
	Roy's Largest Root	5.565	12.522[b]	8.000	18.000	.000	.848	100.178	1.000

a. Design: Intercept + Group

b. Exact statistic

c. Computed using alpha = .05

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[i]
Corrected Model	FUFFMQ_Total	12624.669[a]	1	12624.669	51.844	.000	.675	51.844	1.000
	FUDass_Total	952.017[b]	1	952.017	21.352	.000	.461	21.352	.993
	FUResilience_Total	2609.202[c]	1	2609.202	21.633	.000	.464	21.633	.994
	FUPsychInflex_Total	1612.017[d]	1	1612.017	60.634	.000	.708	60.634	1.000
	FUPerceivedStress_Total	627.267[e]	1	627.267	21.266	.000	.460	21.266	.993
	FUPANASPos_Total	273.067[f]	1	273.067	4.300	.049	.147	4.300	.513
	FUSelfCom_Total	9093.807[g]	1	9093.807	31.542	.000	.558	31.542	1.000
	FUPosReap_Total	252.150[h]	1	252.150	12.611	.002	.335	12.611	.927
Intercept	FUFFMQ_Total	424536.817	1	424536.817	1743.377	.000	.986	1743.377	1.000
	FUDass_Total	31023.424	1	31023.424	695.811	.000	.965	695.811	1.000
	FUResilience_Total	139426.535	1	139426.535	1155.986	.000	.979	1155.986	1.000
	FUPsychInflex_Total	14076.017	1	14076.017	529.452	.000	.955	529.452	1.000
	FUPerceivedStress_Total	20881.785	1	20881.785	707.953	.000	.966	707.953	1.000
	FUPANASPos_Total	23787.141	1	23787.141	374.577	.000	.937	374.577	1.000
	FUSelfCom_Total	169814.400	1	169814.400	589.012	.000	.959	589.012	1.000
	FUPosReap_Total	4974.669	1	4974.669	248.808	.000	.909	248.808	1.000
Group	FUFFMQ_Total	12624.669	1	12624.669	51.844	.000	.675	51.844	1.000
	FUDass_Total	952.017	1	952.017	21.352	.000	.461	21.352	.993
	FUResilience_Total	2609.202	1	2609.202	21.633	.000	.464	21.633	.994
	FUPsychInflex_Total	1612.017	1	1612.017	60.634	.000	.708	60.634	1.000
	FUPerceivedStress_Total	627.267	1	627.267	21.266	.000	.460	21.266	.993
	FUPANASPos_Total	273.067	1	273.067	4.300	.049	.147	4.300	.513
	FUSelfCom_Total	9093.807	1	9093.807	31.542	.000	.558	31.542	1.000
	FUPosReap_Total	252.150	1	252.150	12.611	.002	.335	12.611	.927
Error	FUFFMQ_Total	6087.850	25	243.514					
	FUDass_Total	1114.650	25	44.586					
	FUResilience_Total	3015.317	25	120.613					
	FUPsychInflex_Total	664.650	25	26.586					
	FUPerceivedStress_Total	737.400	25	29.496					
	FUPANASPos_Total	1587.600	25	63.504					
	FUSelfCom_Total	7207.600	25	288.304					
	FUPosReap_Total	499.850	25	19.994					
Total	FUFFMQ_Total	465186.000	27						
	FUDass_Total	32267.000	27						
	FUResilience_Total	151118.000	27						
	FUPsychInflex_Total	15477.000	27						
	FUPerceivedStress_Total	21701.000	27						
	FUPANASPos_Total	26522.000	27						
	FUSelfCom_Total	197194.000	27						
	FUPosReap_Total	6044.000	27						
Corrected Total	FUFFMQ_Total	18712.519	26						
	FUDass_Total	2066.667	26						
	FUResilience_Total	5624.519	26						
	FUPsychInflex_Total	2276.667	26						
	FUPerceivedStress_Total	1364.667	26						
	FUPANASPos_Total	1860.667	26						
	FUSelfCom_Total	16301.407	26						
	FUPosReap_Total	752.000	26						

a. R Squared = .675 (Adjusted R Squared = .662)

b. R Squared = .461 (Adjusted R Squared = .439)

c. R Squared = .464 (Adjusted R Squared = .442)

d. R Squared = .708 (Adjusted R Squared = .696)

e. R Squared = .460 (Adjusted R Squared = .438)

f. R Squared = .147 (Adjusted R Squared = .113)

g. R Squared = .558 (Adjusted R Squared = .540)

h. R Squared = .335 (Adjusted R Squared = .309)

i. Computed using alpha = .05

Univariate Test Results

Source	Dependent Variable	Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Contrast	FUFFMQ_Total	12624.669	1	12624.669	51.844	.000	.675	51.844	1.000
	FUDass_Total	952.017	1	952.017	21.352	.000	.461	21.352	.993
	FUResilience_Total	2609.202	1	2609.202	21.633	.000	.464	21.633	.994
	FUPsychInflex_Total	1612.017	1	1612.017	60.634	.000	.708	60.634	1.000
	FUPerceivedStress_Total	627.267	1	627.267	21.266	.000	.460	21.266	.993
	FUPANASPos_Total	273.067	1	273.067	4.300	.049	.147	4.300	.513
	FUSelfCom_Total	9093.807	1	9093.807	31.542	.000	.558	31.542	1.000
	FUPosReap_Total	252.150	1	252.150	12.611	.002	.335	12.611	.927
Error	FUFFMQ_Total	6087.850	25	243.514					
	FUDass_Total	1114.650	25	44.586					
	FUResilience_Total	3015.317	25	120.613					
	FUPsychInflex_Total	664.650	25	26.586					
	FUPerceivedStress_Total	737.400	25	29.496					
	FUPANASPos_Total	1587.600	25	63.504					
	FUSelfCom_Total	7207.600	25	288.304					
	FUPosReap_Total	499.850	25	19.994					

a. Computed using alpha = .05

Estimates[a]

Group	Mean	Std. Error	df	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Control	.381	.050	19.793	.277	.486
MARST	.392	.045	26.465	.299	.485

a. Dependent Variable: cortisol.

Pairwise Comparisons[a]

(I) Group	(J) Group	Mean Difference (I-J)	Std. Error	df	Sig.[b]	95% Confidence Interval for Difference[b] Lower Bound	95% Confidence Interval for Difference[b] Upper Bound
Control	MARST	-.010	.068	22.517	.878	-.150	.129
MARST	Control	.010	.068	22.517	.878	-.129	.150

Based on estimated marginal means

a. Dependent Variable: cortisol.

b. Adjustment for multiple comparisons: Bonferroni.

Univariate Tests[a]

Numerator df	Denominator df	F	Sig.
1	22.517	.024	.878

The F tests the effect of Group. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.[a]

a. Dependent Variable: cortisol.

Estimates[a]

Time	Mean	Std. Error	df	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Pre	.658	.044	55.924	.569	.747
Post	.209	.049	58.445	.111	.308
FU	.292	.056	60.651	.180	.405

a. Dependent Variable: cortisol.

Pairwise Comparisons[a]

(I) Time	(J) Time	Mean Difference (I-J)	Std. Error	df	Sig.[c]	95% Confidence Interval for Difference[c] Lower Bound	95% Confidence Interval for Difference[c] Upper Bound
Pre	Post	.449*	.059	37.215	.000	.300	.597
	FU	.366*	.065	40.023	.000	.203	.529
Post	Pre	-.449*	.059	37.215	.000	-.597	-.300
	FU	-.083	.068	38.431	.685	-.253	.087
FU	Pre	-.366*	.065	40.023	.000	-.529	-.203
	Post	.083	.068	38.431	.685	-.087	.253

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

a. Dependent Variable: cortisol.

c. Adjustment for multiple comparisons: Bonferroni.

Univariate Tests[a]

Numerator df	Denominator df	F	Sig.
2	38.480	32.425	.000

The F tests the effect of Time. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.[a]

a. Dependent Variable: cortisol.

3. Group * Time[a]

Group	Time	Mean	Std. Error	df	95% Confidence Interval	
					Lower Bound	Upper Bound
Control	Pre	.729	.070	55.924	.589	.868
	Post	.172	.073	57.674	.026	.319
	FU	.243	.077	59.127	.089	.398
MARST	Pre	.588	.055	55.924	.477	.698
	Post	.246	.066	59.271	.115	.378
	FU	.341	.082	60.990	.178	.504

a. Dependent Variable: cortisol.

Group Statistics

Time		Group	N	Mean	Std. Deviation	Std. Error Mean
Pre	cortisol	Control	10	.728560	.3378859	.1068489
		MARST	16	.587706	.2775352	.0693838
Post	cortisol	Control	9	.167921	.1414137	.0471379
		MARST	11	.260113	.1654999	.0499001
FU	cortisol	Control	8	.259487	.1309811	.0463088
		MARST	7	.352886	.1834887	.0693522

Independent Samples Test

Time			Levene's Test for Equality of Variances		t-test for Equality of Means						
			F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
										Lower	Upper
Pre	cortisol	Equal variances assumed	2.681	.115	1.159	24	.258	.1408537	.1215729	-.1100604	.3917679
		Equal variances not assumed			1.106	16.437	.285	.1408537	.1274002	-.1286403	.4103478
Post	cortisol	Equal variances assumed	.002	.964	-1.321	18	.203	-.0921916	.0697828	-.2387998	.0544166
		Equal variances not assumed			-1.343	17.947	.196	-.0921916	.0686440	-.2364381	.0520549
FU	cortisol	Equal variances assumed	1.295	.276	-1.146	13	.272	-.0933982	.0814659	-.2693946	.0825982
		Equal variances not assumed			-1.120	10.717	.287	-.0933982	.0833920	-.2775359	.0907394