

**A FIVE–WEEK MINDFULNESS PROGRAM FOR EMERGING ADULTS  
EXPERIENCING ANXIOUS AND / OR DEPRESSIVE SYMPTOMS**

BENJAMIN D. DIPLOCK

A THESIS SUBMITTED TO THE FACULTY OF GRADUATE STUDIES IN  
PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF  
MASTER OF ARTS

GRADUATE PROGRAM IN PSYCHOLOGY

YORK UNIVERSITY,  
TORONTO, ONTARIO

AUGUST 2019

© BENJAMIN D. DIPLOCK, 2019

## **Abstract**

Emerging adulthood is the highest risk period for developing mental health issues compared to other periods across the lifespan. Despite this high risk, emerging adults (EAs) experience especially long wait-times for mental health services. Therefore, preventative, evidence-based treatment is needed to enhance coping among EAs. Recent studies suggest a beneficial role for brief mindfulness-based interventions (bMBI) in addressing mental health symptom burden. High quality research is needed to demonstrate whether bMBIs can provide efficacious treatment to improve the lives of EAs. The current study tested the efficacy of a five-week bMBI baseline within-subject controlled trial. The results of this preliminary analysis indicated that this bMBI was 1) effective in improving psychological distress and wellbeing outcomes and maintaining these improvements one-month following; and 2) that high pre-intervention self-compassion influenced primary outcomes. The current findings lend support for an efficacious preventative strategy and provide direction for increased services in post-secondary education.

## Table of Contents

Abstract .....	ii
Table of Contents .....	iii
List of Tables .....	v
List of Figures .....	vi
Chapter 1: Introduction .....	1
Mental Illness in Emerging Adulthood .....	1
Mindfulness-Based Interventions as an EA Mental Health Prevention .....	2
Dosage & Brief MBIs .....	3
Theoretical Foundations for the Current Study .....	5
Dual-Factor Model of Mental Health .....	5
Self-compassion and Mindfulness-based Interventions .....	7
The Process Models of Emotion Regulation .....	8
Stress-Diathesis Model and Emerging Adults at University .....	10
Stress buffering hypothesis .....	11
Mindfulness Stress-Buffering Model .....	14
Objectives .....	15
Chapter 2: Method .....	18
Participants .....	18
Procedure .....	20
Measures .....	20
Depressive Symptoms .....	20
Anxious Symptoms .....	21
Mental Wellbeing .....	21
Perceived Stress .....	22
Emotion Regulation .....	22
Self-Compassion .....	23
Study Intervention .....	24
Chapter 3: Results .....	28
Are the effects of the brief mindfulness intervention sustained over a one-month period? .....	34
Are there latent effects of the brief mindfulness intervention from post-intervention over the one-month follow-up period? .....	35
The moderating roles of self-compassion on the improvements through the mindfulness-based intervention .....	36
Pre- to Mid-Intervention .....	36
Pre- to Post-Intervention .....	38
Pre- to One-month follow-up .....	41
The moderating role of perceived stress on the improvements through the mindfulness-based intervention .....	41
Chapter 4: Discussion .....	42

Moderating factors for intervention efficacy.....	45
Chapter 5: Limitations .....	48
Chapter 6: Directions for Future Research .....	51
Chapter 7: Conclusions .....	52
Bibliography .....	53
Appendices .....	77
Appendix A: Variability in Time Between Baseline and Pre-Measure .....	77
Appendix B: HPRC Informed Consent Form / On-line Consent Script .....	78
Appendix C: Questionnaire Battery .....	80
Appendix D: York Colleges System & Student Accessibility Services Email Script .....	91
Appendix E: Flow Chart for Study Recruitment .....	92
Appendix F: Additional Mental Health Difficulties Screener.....	93
Appendix G: Reliability Analysis .....	98
Appendix H: Correlation Analysis .....	99
Appendix I: Clinical Change .....	100

## List of Tables

Table 1: Baseline Characteristics.....	8
Table 2: Summary of Means, and Standard Deviations for Anxious Symptoms, Depressive Symptom, Mental Wellbeing, Self-Compassion Perceived Stress, Reappraisal, and Suppression.....	9
Table 3: Linear Mixed Effects Model of the Effects of Time (Pre- to post-treatment) on Anxious Symptoms, Depressive Symptom, Mental Wellbeing, Self-Compassion Perceived Stress, Reappraisal, and Suppression.....	33
Table 4: Linear Mixed Effects Model of the Effects of Time (Pre- to one-month follow-up) on Anxious Symptoms, Depressive Symptom, Mental Wellbeing, Self-Compassion Perceived Stress, Reappraisal, and Suppression.....	34
Table 5: Linear Mixed Effects Model of the Effects of Time (Post- to one-month follow-up) on Anxious Symptoms, Depressive Symptom, Mental Wellbeing, Self-Compassion Perceived Stress, Reappraisal, and Suppression.....	35
Table 6: Anxious Symptoms, Depressive Symptoms and Mental Wellbeing Predicted from Time (Pre- to Mid-Intervention) and Self-Compassion.....	37
Table 7: Conditional Effects of Mid-Intervention on Anxious Symptoms.....	37
Table 8: Anxious Symptoms, Depressive Symptoms and Mental Wellbeing Predicted from Time (Pre- to Post-Intervention) and Self-Compassion.....	39
Table 9: Conditional Effects of Post-Intervention on Anxious Symptoms.....	39
Table 10: Conditional Effects of post-intervention on depressive symptoms.....	40
Table 11: Conditional Effects of post-intervention on mental wellbeing.....	40

## List of Figures

Figure 1: Hypothetical developmental trajectories of compassion and mindfulness.....	8
Figure 2: Process Model of ER.....	9
Figure 3: Stress buffering and social support.....	12
Figure 4: Primary study objective: Efficacy of a five-week bMBI.....	16
Figure 5: Secondary study objective: Moderating role of pre-intervention scores on primary outcomes...	17
Figure 5: Stress buffering and social support.....	31
Figure 6: Anxious Symptoms by Time.....	31
Figure 7: Depressive Symptoms by Time.....	31
Figure 8: Mental Wellbeing by Time.....	32
Figure 9: Self-Compassion by Time.....	32
Figure 10: Perceived Stress by Time.....	32
Figure 11: Reappraisal by Time.....	32
Figure 12: Suppression by Time.....	32
Figure 13: Anxious Symptoms Predicted from Time (Pre- to Mid-Intervention) and Self-Compassion...	37
Figure 14: Anxious Symptoms Predicted from Time (Pre- to Post-Intervention) and Self-Compassion...	39
Figure 15: Depressive Symptoms Predicted from Time (Pre-to Mid-Intervention) and Self-Compassion.....	40
Figure 16: Mental Wellbeing Predicted from Time (Pre-to Post-Intervention) and Self-Compassion.....	41

## **Chapter 1: Introduction**

### **Mental Illness in Emerging Adulthood**

Mental illness is a major source of disease burden among young people in developed countries (Lopez, Mathers, Ezzati, Jamison, & Murray, 2006; Patel, Flisher, Hetrick & McGorry, 2007). Emerging adulthood (EA; 18-29 years old) is a distinct and critical period of mental health development (Arnett, Žukauskiene, & Sugimura, 2014). EAs experience elevated distress and mental illness, particularly depressive and anxious symptoms (Ferro, Gorter, & Boyle, 2015; McGorry, Bates, & Birchwood, 2013). Consistent with data indicating that the onset of 75% of all mental health disorders occurs by the age of 24, up to 60% of Ontario university students report feeling hopeless and up 43% “feel so depressed that they were not able to function” (Ontario College Health Association, 2009, p. 5). Concern surrounding EAs’ elevated mental health difficulties has resulted in a shift from reactive treatment to preventative early stage mental health services; further preventative, early stage, evidence-based treatment is needed to enhance coping among EAs (Kessler et al., 2005; McGorry Purcell, Goldstone, & Amminger, 2011; Mental Health Commission of Canada, 2017; Ontario College Health Association, 2009; American College Health Association, 2009; Pettit, Roberts, Lewinsohn, Seeley, & Yaroslavsky, 2011; Statistics Canada, 2012).

Despite increased mental health needs on university campuses, symptoms often go untreated (Davis & Vander Stoep, 1997; Luo, 1994; McGorry et al., 2011; Royal College of Psychiatrists London, 2011; Wang, Berglund, & Kessler, 2000). Long service wait times are especially common for Canadian EAs and are compounded by insufficient strategic policies to ensure services for these students (Mental Health Commission of Canada, 2017; Sukhera, Lynch, Wardrop, & Miller, 2017). Many studies show that if mental health problems go untreated, there

is an increased risk for long-term social and functional disability (Jones, 2013; Kessler et al., 2005; McGorry et al., 2013). The benefit of early intervention for symptom reduction is widely supported (Hetrick et al., 2008; Kessler, R. C., Berglund, P., Demler, O., Jin, R., Merikangas, K. R., & Walters, 2005; Reinherz, Paradis, Giaconia, Stashwick, & Fitzmaurice, 2003); however, few EA evidence-based treatment options exist (De Girolamo, Dagani, Purcell, Cocchi, & McGorry, 2012). Rather, gold-standard behavioural therapies (e.g., Cognitive Behavioural Therapy) for adult clinical populations are being adapted to EA populations. An EA university-wide mental health strategy and an age-appropriate, evidence-based service is essential, given that EAs have significant mental health needs (Locke, Bieschke, Castonguay, & Hayes, 2012; McGorry et al., 2011; Mental Health Commission of Canada, 2017; Ontario College Health Association, 2009; Sukhera, Fisman, & Davidson, 2015). Therefore, the current study investigated the efficacy of a five-week, five session preventative intervention for EAs attending York University, which was expected to improve mental health of EA students with elevated depressive and anxious symptoms.

### **Mindfulness-Based Interventions as an EA Mental Health Prevention**

Over the past 15 years, there has been a major increase of public and research focus on mindfulness and mindfulness-based interventions (MBIs; Pickert, 2014). MBIs are individual or group-based psychological treatments for coping with distress, with the goal of improving mental health. Results from clinical trials of MBI support the role of mindfulness practices in improving a wide range of outcomes and sequelae, including affect and stress, as well as mental and physical health outcomes (Chiesa, Calati, & Serretti, 2011; Grossman, Niemann, Schmidt, & Walach, 2004; Lindsay & Creswell, 2017; Smith et al., 2008; Tang, Hölzel, & Posner, 2015). MBIs have been proposed as a plausible treatment for populations experiencing depressive and



anxious symptoms, given that their efficacy has been repeatedly demonstrated across clinical populations (Y. Chen, Yang, Wang, & Zhang, 2013; Grossman et al., 2004; Hofmann, Sawyer, Witt, & Oh, 2010; Kuyken et al., 2010; Nyklíček, Dijkman, Lenders, Fonteijn, & Koolen, 2014; Piet & Hougaard, 2011; Song & Lindquist, 2015).

This intersection of a large body of literature suggesting a need for preventative interventions to improve EA mental health, with literature proposing the efficacy of MBIs, led to our team's evidence-based and hypothesis driven investigation of the possibility of an MBI for EAs. Objectives for the current study were informed and directed by the following theories, models and literature: the Dual-Factor Model of Mental Health, the self-compassion, and stress-diathesis literature (i.e., stress buffering hypothesis) and the mindfulness literature (i.e., The Conditional Process Model of Mindfulness and ER). These theories led to: 1) the primary study objective to examine the efficacy of a five-week mindfulness-based intervention to improve and maintain mental health among EAs with elevated depressive and anxious symptoms and 2) the secondary study objective to examine moderating roles of pre-intervention scores of perceived stress and self-compassion, on the primary health-related outcomes.

### **Dosage & Brief MBIs**

Traditionally, mindfulness-based treatment programs have included eight weekly 2.5 hour classes (20 hours), a weekend long retreat (six hours), and 30 – 60 minutes (each day) of home practice assigned (Kabat-Zinn, 1990). Although efficacious, 'traditional' MBIs are very demanding in terms of time and homework and have high attrition rates (Chang et al., 2004); therefore, they are not feasible or cost effective to figure prominently in an EA university-wide mental health prevention strategy. For populations in which the reduction of psychological distress is a primary focus and time commitment poses a barrier to access, briefer mindfulness-

based interventions have been recommended (Carmody & Baer, 2009). Although traditional eight-week mindfulness-based interventions have the most support for efficacy (Carmody & Baer, 2009), “there is [currently] no one-size-fits-all recommendation for how one should dose one’s mindfulness intervention training programs” (Creswell, 2017) and there is no significant correlation between effect size and dosage (i.e., in class hours, homework and teacher training); (Carmody & Baer, 2009; Khoury et al., 2013; Toneatto & Nguyen, 2007).

Research has begun to shed light on dosage and efficacy. Six to eight sessions of brief-psychotherapy (30 minute interventions) have been efficacy for acute depression (Nieuwsma et al., 2012), and even ultra-brief psychotherapeutic interventions (single session to multisession interventions lasting up to two weeks) have been associated with small clinical effects (Schumer, Lindsay, & David Creswell, 2018). Within the EA literature, a study of a brief trial (1 hour per week; four weeks) intervention revealed that participants experienced medium to large clinical change in mindfulness, anxiety and depressive symptoms (Shearer, Hunt, Chowdhury, & Nicol, 2015).

A recent unpublished pre-post pilot study on a five-week brief MBI (bMBI) indicated that the program was efficacious in reducing depression, anxiety, stress, and improving wellness in adult (mood and anxiety) psychiatric outpatients (Selchen & Diplock, 2019). Following the success of the pilot study, Selchen and Diplock recommended that research in this area continue to test the interventions efficacy in populations struggling from mental health difficulties. Similarly, recent studies have illustrated the benefit of other bMBIs ( $\leq 8$  weeks) for clinical and non-clinical EA student populations with affective difficulties, addiction and/or stress (Lancaster, Klein, & Knightly, 2016; Mermelstein & Garske, 2015; Monshat et al., 2013; Nyklíček et al., 2014; Song & Lindquist, 2015; Winnebeck, Fissler, Gärtner, Chadwick, &

Barnhofer, 2017; Zeidan, Johnson, Gordon, & Goolkasian, 2010). These studies indicate promise for prevention programming in populations with elevated distress and long wait times, such as EA university students (Song & Lindquist, 2015). To date, there are no studies that have focused on the efficacy of this five-week bMBI, and to our knowledge, there are limited research and few studies that have revealed the efficacy of bMBIs in a non-clinical EA university population more broadly.

Individuals who experience high distress levels (e.g., EAs, university students), with symptoms that can be exacerbated by stress (e.g., depressive, anxious symptoms), may benefit the most from an MBI and in a relatively brief period of time (Bergin & Pakenham, 2016; Cohen, Janicki-Deverts, & Miller, 2007; Winnebeck et al., 2017) (see the Mindfulness Stress Buffering Model section below, page 18 – 19.) The brevity of these interventions makes them suitable for EA university students, who have heightened risk for mental health difficulties, demanding schedules (e.g., heightened distress) and who experience long wait times for mental health services. There is a need for an efficacious, feasible, and brief early intervention for EAs to reduce mental health symptoms and wait times (Fergusson, Horwood, Ridder, & Beauvais, 2005). The following section provides the theoretical foundation for including a preventative bMBI for EAs with mental health difficulties.

### **Theoretical Foundations for the Current Study**

**Dual-Factor Model of Mental Health.** Traditionally, the field of clinical psychology has been based on a medical model, a pathogenic approach to dealing with psychological and distress-related difficulties, in which health is considered the absence of illness or disability (Antaramian, Scott Huebner, Hills, & Valois, 2010; Westerhof & Keyes, 2010). As early as 1948, the World Health Organization began to challenge the medical model, defining health as

not only an absence of illness, but also the presence of psychical and mental well-being (World Health Organisation (WHO), 1946) . Following this health perception shift, seminal work on positive mental health and the recent emergence of the field of positive psychology has increased the focus on positive psychological factors that potentially contribute to well-being and overall health (Gurin, Veroff, & Feld, 1960; Jahoda, 1958). Positive psychology has begun to uncover the importance of certain adaptive constructs such as subjective well-being (SWB), which comprises positive and negative affect, along with life satisfaction (Diener, Oishi, & Lucas, 2012). Particular emphasis has been placed on the importance of SWB for young people, with the long-term health benefits of high SWB for young adults (Huebner, 2004; Seligman & Csikszentmihalyi, 2000; Seligman et al., 2005).

Despite the inclusion of positive constructs within psychological well-being research in recent years, psychopathology and mental well-being continue to be conceptualized as part of a single continuum – wellness on one extreme and pathology on the other (Antaramian et al., 2010). In recent years an alternate model has emerged – the Dual-Factor Model of Mental Health – which posits that distress and well-being are two unique, interrelated latent variables (Greenspoon & Saklofske, 2001; Suldo & Shaffer, 2008). Greenspoon and Saklofske (2001) noted the need for preventative intervention studies for both well-being and distress-related outcomes among young adults.

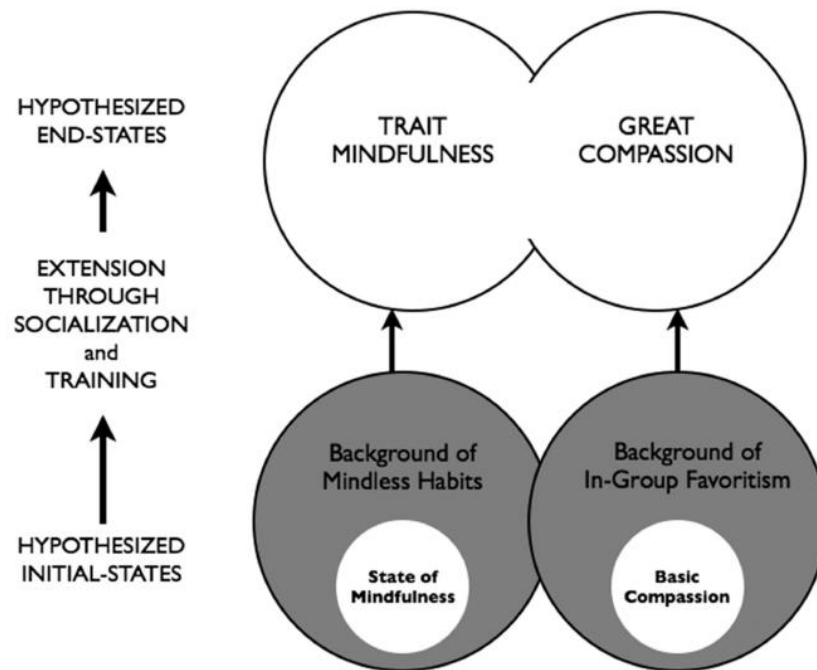
In line with the dual factor model and the need for intervention studies focused on mental health and well-being, the current intervention study focuses on a bMBI with measures of well-being (i.e., mental well-being, mindfulness, acceptance, self-compassion) and psychological distress (i.e., depressive symptoms, anxious symptoms, emotion regulation, stress)

**Self-compassion and Mindfulness-based Interventions.** In the 20<sup>th</sup> century, self-esteem – the judgments and evaluation of one’s self worth, as compared to others (Coopersmith, 1967; Harter, 1999) – was considered a primary measure of psychological well-being. Although the benefits of elevated self-esteem are highly touted, research has revealed pitfalls associated with elevated levels of self-esteem (Aberson, Healy, & Romero, 2000; Baumeister, Smart, & Boden, 1996). The use of self-esteem as a primary measure of well-being has been criticized and alternative constructs – “conceptualizations of a healthy attitude and relationship to oneself” – have emerged in the literature with constructs such as true self-esteem, self-efficacy, and the construct of self-compassion (Neff, 2003, p. 86).

Self-compassion - an important concept in Buddhist philosophy (Engler, 1998; Epstein, 1995; Rubin, 1999) – is defined as extending compassion to oneself in times of difficulty and comprises three major concepts: self-kindness, humanity, and mindfulness (Neff, 2003; Neff, 2008). In contrast to self-esteem, self-compassion does not require individuals to participate in downward social comparisons or any self-evaluation and self-judgement (positive or negative), reducing tendencies towards narcissism and self-focus, as well as increasing engagement with others (Finn, 1990; McMillan, Singh, & Simonetta, 1994; K. Neff, 2003).

Roeser and Eccles’s (2015) developmental trajectories of compassion and mindfulness model (see Figure 1) highlights that: a) individuals (e.g. University EAs) have an intrinsic capacity for mindfulness and compassion that can be developed and b) through sustained, intentional practice and socialization, lasting mindfulness and compassion traits (e.g., reduced automaticity, mindlessness, and self-criticalness) can be fostered (Bargh & Chartrand, 1999; Langer, 1989). As an alternative psychological health outcome measure, self-compassion had shown promising, consistent relations with various measures of affect, psychopathology, and

well-being (MacBeth & Gumley, 2012; Neff, Kirkpatrick, & Rude, 2007; Neff & Vonk, 2009; Roeser & Eccles, 2015). Self-compassion is a better predictor of health-related outcomes for internalizing disorders than other mindfulness measures (Van Dam, Sheppard, Forsyth, & Earleywine, 2011).



*Figure 1. Hypothetical developmental trajectories of compassion and mindfulness.* Adapted [reprinted] from "Mindfulness and Compassion in Human Development: Introduction to the Special Section," by R. Roeser and J Eccles, 2015, *Developmental Psychology*, 51, 2. Copyright 2015 by "American Psychological Association".

**The Process Models of Emotion Regulation.** ER, as a psychological construct, is a higher-order process by which one consciously and unconsciously modulates emotions to effectively respond to environmental factors and environmental demands (Bargh & Williams, 2007; Campbell-Sills & Barlow, 2007; Gross & Munoz, 1995; Rottenberg & Gross, 2003). ER difficulties are strongly correlated with internalizing disorders (Aldao, Nolen-Hoeksema, & Schweizer, 2010; Gross & Jazaieri, 2014).

One of the first models of ER – the Process Model of ER – revealed that emotions could be regulated prior to an event (antecedent-focused ER) or following an event (response-focused ER; see Figure 2). Originally, the process model posited that antecedent-focused ER strategies were adaptive and protective against psychopathology (e.g., reappraisal), whereas response-focused ER strategies were maladaptive (e.g., suppression; Gross & John, 2003). In line with this model, cognitive interventions that are largely antecedent-focused (e.g., Cognitive Behavioral Therapy; CBT) have been associated with effective reappraisal of cognitive and emotional events (Hofmann & Asmundson, 2008). Overtime, it has become clear that the effectiveness of strategies is more dynamic than this early conceptualization suggested (Chambers, Gullone, & Allen, 2009), with many different adaptive (e.g., acceptance, problem solving) and maladaptive (e.g., thought/expressive suppression, experiential avoidance) ER techniques (Chambers et al., 2009).

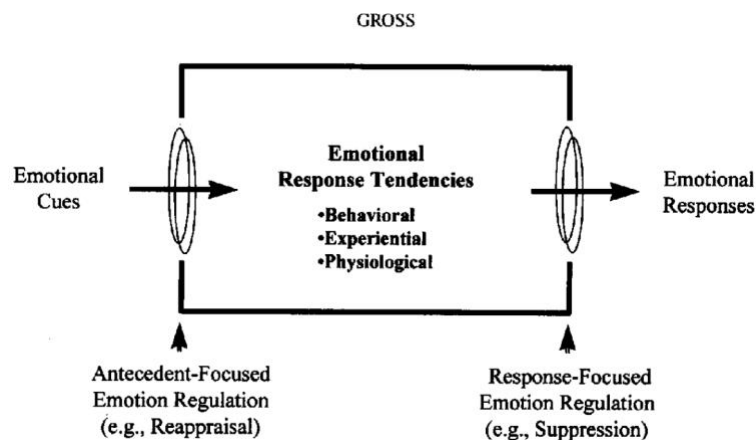


Figure 2. *Process Model of ER*. Adapted [reprinted] from “Emotion Regulation and Mental Health,” by J. Gross and R Muñoz, 1995, *Clinical Psychology: Science and Practice*, 2, 152. Copyright 1995 by “American Psychological Association”.

Research has illustrated the effectiveness of reappraisal – cognitively re-evaluating situations to perceive them in ways that will lower associated distress – in CBT. At the same time, CBT and reappraisal of thoughts and emotions can lead individuals to increase their use of avoidance of unpleasant emotions (maladaptive ER strategy), which is associated with psychological distress (S. C. Hayes & Wilson, 2003). In contrast to altering the content of events (antecedent-focused) in CBT, mindfulness and acceptance based approaches change one's relationship with an event (response focused), by learning to accept and observe emotional experiences (Hofmann & Asmundson, 2008; Whelton, 2004). In this way, mindfulness specifically targets experiential avoidance and thought suppression (S. C. Hayes & Wilson, 2003) and may be well suited for populations in which the context cannot be easily altered (e.g., emerging adults with demanding and dynamic school schedules).

Mindfulness and adaptive ER are robustly related (Desrosiers, Vine, Klemanski, & Nolen-Hoeksema, 2013; Garland, Gaylord, & Fredrickson, 2011; Hölzel et al., 2011). Mindfulness practice may precede adaptive ER functioning, with mindfulness viewed as a special type of cognitive reappraisal (Chambers et al., 2009; Roemer, Williston, & Rollins, 2015). The non-judgmental reframing of mindfulness may reduce self-critical past and future thinking, which in turn reduces internalizing symptoms (Carmody & Baer, 2009; Hill & Updegraff, 2012; Kumar, Feldman, & Hayes, 2008). Mindfulness may occur through non-reactivity (Chambers et al., 2009; Hölzel et al., 2011).

**Stress-Diathesis Model and Emerging Adults at University.** Historically, theorists have pursued an understanding of the antecedents and etiology of mental health problems (Rosenthal & Fode, 1963) with two major theoretical viewpoints: a) that individuals who develop a mental health disorder differ in premorbid mental health vulnerabilities (diathesis)



from those who do not, and b) elevated stress is an important aspect that may activate vulnerabilities, and transform predisposition into manifestation of mental health difficulties (Colodro-Conde et al., 2017; Rosen, 1959). These two theories were combined to encompass both heredity and environmental effects – the diathesis-stress model, which has been used to conceptualize and understand the emergence of a broad number of disorders (Rosenthal, 1963), including depression (Beck, 1987; Robins & Block, 1988) and anxiety (Morrison & O'Connor, 2005; Nolen-Hoeksema, 2000). In the simplest terms, this theory suggests that heightened stress triggers a diathesis (pre-existing vulnerability), resulting in the transition of a mental health vulnerability into the manifestation of a mental health disorder (Monroe & Simons, 1991).

During university, students deal with new academic, work, financial, and relationship demands. For many students, coping with all of these new challenges can be stressful, particularly when they are compounded (Disch, Harlow, Campbell, & Dougan, 2000; Ross, Niebling, & Heckert, 1999). Research on the diathesis-stress model has led to a consideration of factors that help to reduce perceived stress with the stress buffering model, which is described next.

**Stress buffering hypothesis.** Stress occurs when an individual: a) appraises and assesses a situation as threatening or arduous, b) knows that a situation is important to respond to (Sells, 1970, p. 134 - 139), but c) does not have proper coping techniques to overcome these challenges (Lazarus, 1974; Lazarus & Launier, 1978). As a result of stress appraisal, individuals typically experience negative affect, elevated physiological reaction, and/or behavioral reactions (Baum, Singer, & Baum, 1981). Although one stressful event may not place too much strain on coping capacities, compounded problems, which tax problem-solving capacity, can promote serious disorder (Wills, & Langner, 1980, p. 159 - 173).

This conceptualization of stress links stress appraisals with helplessness, loss of control and reduced self-esteem, due to a perceived inability to cope with situations that require efficient responses (Garber & Hollon, 1980). The stress buffering hypothesis holds that adequate social support can play a key role in buffering stress from manifesting into mental health difficulties, at two points during stressful events. As illustrated in Figure 3, support may help to bypass or mitigate the perceived stress of the event by making the individuals feel that they have the resources available to cope with the challenges. If the situation is appraised as stressful, support may help reduce emotional and physiological (e.g., neuroendocrine) reactivity and/or promote positive behavioral reactivity (Cohen et al., 2007; Cohen & Wills, 1985).

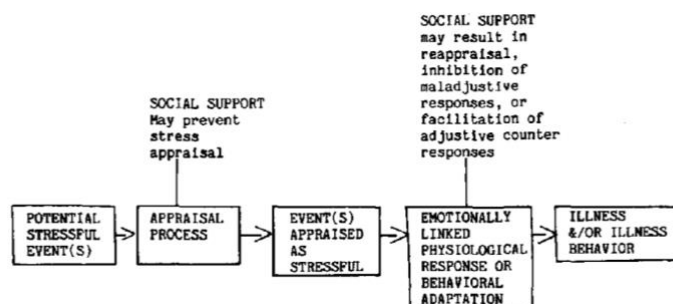


Figure 3. Stress buffering and social support. Adapted [reprinted] from “Stress, Social Support, and the Buffering Hypothesis,” by S. Cohen and T. Ashby Willis, 1985, *Psychological Bulletin*, 98, 313. Copyright 1985 by "American Psychological Association".

There are four key types of social support that Cohen & Wills (1985) identified. Esteem support (e.g., emotional support, expressive support, self-esteem support) helps individuals know that they are esteemed and accepted and are enhanced by others’ validation of personal value and acceptance. Informational support (e.g., advice, appraisal support, and cognitive guidance) is problem solving, to help define, comprehend and deal with challenges. Social companionship (e.g., diffuse support and belongingness) is spending leisure and recreational time with others

and may reduce stress through social interaction, distraction from difficulties and/or by bolstering positive mood. Finally, instrumental support is the facilitation of financial aid, material resources, and needed services. Instrumental support (e.g., aid, material support) may help resolve problems or increase time for positive activities (Cobb, 1976; Wills, Cohen, & Syme, 1985).

When these supports (e.g., esteem, information, social, instrumental) are not present, stress appraisal and psychological distress can compound, and without healthy coping techniques or supports, mental health disorders may arise. Depression, which includes negative cognitions and maladaptive perceptions (e.g. low self-worth, pessimism, futility, and exaggerated negative experiences and rumination of these events) may develop with accompanying difficulties in inhibiting irrelevant negative content (Foland-Ross & Gotlib, 2012; Gotlib & Joormann, 2010). Stressful life experiences have been associated with depressive symptoms (Hammen, 2005; Mazure, 1998; Monroe & Simons, 1991), with 50-80% of individuals with depression having experienced a stressful life event (Monroe & Simons, 1991) three to six months before the onset of the disorder. Depression develops in up to 25% of individuals who have experienced major life stressors (Van Praag, de Kloet & van Os, 2004). Increased stress has also been associated with longer duration, heightened symptoms and recurrence of depressive symptoms (Hammen, 2005; Mazure, 1998).

Heightened stress can promote anxiety, including symptoms of neuroticism (interpreting the world as threatening and dangerous), rumination, and negative emotional reactions (Barlow, Ellard, Sauer-Zavala, Bullis, & Carl, 2014; Griffith et al., 2010; Lahey, 2009). Maladaptive coping techniques, such as avoidant thought, have been associated with less support utilization

and lower likelihood of confiding in others (Nolen-Hoeksema & Morrow, 1991). These avoidant tendencies increase the likelihood of negative behavior (Morrison & O'Connor, 2005).

**Mindfulness Stress-Buffering Model.** Building on the diathesis-stress model and stress buffering hypothesis, Creswell's (2014) developed the mindfulness-stress buffering hypothesis with which he posited that the effects of MBI on health outcomes are explained by reduced stress-reactivity and stress-appraisals (Creswell & Lindsay, 2014; Winnebeck et al., 2017). Specifically, the premise underlying MBIs is that focusing on the present moment, non-judgmentally and openly (i.e., not attempting to avoid particular thoughts), can interfere with acute stress appraisals and thereby reduce physiological, behavioural and emotional responses to stress. This present focus is in contrast to excessive focus on the past or future when coping with stress, which has been associated with depressive and anxious symptoms (Kabat-Zinn, 2003). Further, mindfulness helps to teach participants to respond to stressful situations reflectively instead of reflexively, helping to further intervene from the use of maladaptive behaviours such as avoidance and rumination (S. C. Hayes, Luoma, Bond, Masuda, & Lillis, 2006). By inhibiting these maladaptive coping techniques – believed to contribute to preservation of many emotional disorders (Bishop et al., 2004; S. C. Hayes, 2004) – mindfulness can help mitigate the prolongation of mental health difficulties. Further, the gentle, deliberate mindful breathing and sequential attention directed towards specific regions of the body (i.e., body scans) may help to ameliorate acute physiological symptoms of stress (e.g., cortisol, blood pressure, muscle reactivity; Brown, Weinstein, & Creswell, 2012; Desrosiers et al., 2013; Nyklíček et al., 2013), by balancing sympathetic and parasympathetic responses (Kabat-Zinn, 1982, 2003). The mindfulness stress buffering theory has two central premises. First, individuals who experience high stress burden (e.g., EAs, university students) have inadequate coping techniques

and will experience the greatest effects from participating in a MBI (in comparison to individuals with low levels of stress and adequate coping skills). Secondly, individuals with symptoms that are exacerbated by stress (e.g., depression, anxiety) may benefit the most and in the briefest period of time from a bMBI (as mindfulness provides techniques that can help to reduce acute stress reactivity; Cohen et al., 2007; Huffziger & Kuehner, 2009; A. R. Singer & Dobson, 2007; Winnebeck et al., 2017).

In summary, the current study was based on the Dual-Factor Model of Mental Health, self-compassion literature and Mindfulness Stress Buffering Hypothesis. This study comprised an evaluation of an intervention shown to have effects on outcomes of positive states, as well as both psychological distress and well-being. This study also included self-compassion as an outcome, because it is a better predictor of health-related outcomes for internalizing disorders than other mindfulness measures. The Mindfulness Stress Buffering hypothesis provided theoretical support for the application of a bMBI in post-secondary populations with mood and/or anxiety difficulties, to reduce perceived stress and improve mental well-being. This theory, along with the self-compassion literature also provided support for investigating gaps in the literature, specifically the moderating self-compassion and perceived stress measures.

### **Objectives**

The proposed study focused on a five-week, five session preventative bMBI for EAs attending York University that was expected to improve mental health of EA students with elevated depressive and anxious symptoms. The primary objective of this study was to examine the efficacy of the five-week bMBI in improving and maintaining mental health across five timepoints previous to, during and after the intervention. I hypothesized that:

1. There is a main effect for time with statistically and clinically significant improvement (measured by Cohen's  $d$  effect size) in primary (depressive symptoms, anxious symptoms and mental well-being) and secondary outcomes (self-compassion, perceived stress and ER) from: a) pre-intervention to post-intervention, c) post-intervention to one-month follow-up b) pre-intervention to one-month follow-up. No difference is expected between baseline and pre-intervention timepoints (see Figure 4).

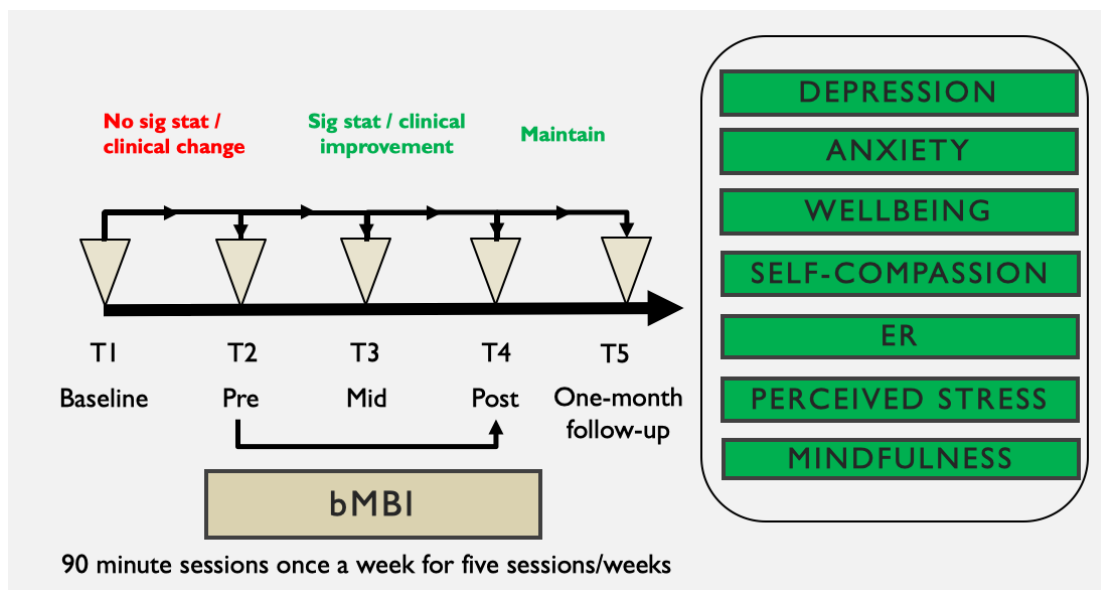


Figure 4. Primary study objective: Efficacy of a five-week bMBI

The secondary objective of the study was to examine the independent moderating roles of pre-intervention scores of perceived stress and self-compassion, on the primary health-related outcomes. I hypothesized that:

1. Pre-intervention stress moderates the relationship between the bMBI, mental health and well-being related outcomes for depression and anxiety (Creswell & Lindsay, 2014), such that significant or large improvements from pre- to post and one month

- follow-up will be seen in those with the highest initial stress scores, and insignificant or minimal improvements in those with small initial stress scores (see Figure 5).
2. Pre-intervention self-compassion moderates the relationship between the bMBI and mental health related outcomes, such that significant and large improvements from pre- to post and one month follow-up are found in those with lower initial self-compassion scores, and insignificant or minimal improvements in those with higher initial self-compassion scores (Refer to Figure 5).

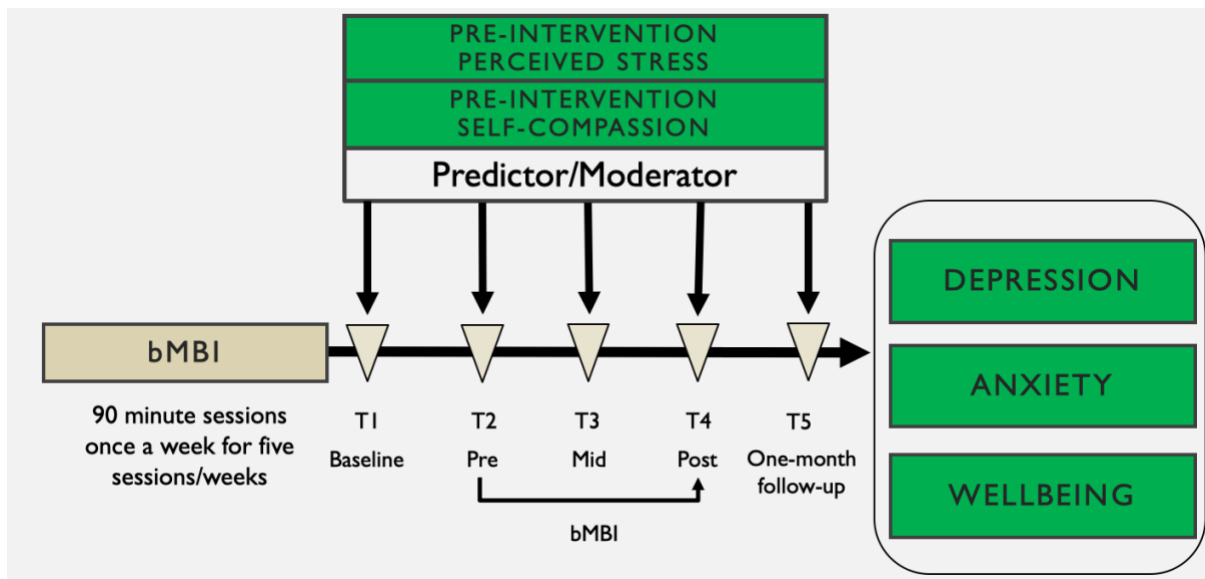


Figure 5. Secondary study objective: Moderating role of pre-intervention scores on primary outcomes

## Chapter 2: Method

### Participants

The current study sample comprised a total of 55 participants ( $n_{\text{group}}= 7$ ). Eligible participants included any consenting EAs, attending York University, aged between 18 to 29 (Arnett et al., 2014), with self-report scores of eight on the Generalized Anxiety Disorder-7 (GAD-7) and/or 10 on the Patient Health Questionnaire-9 (PHQ-9; (NHS, 2018); (Manea, Gilbody, & McMillan, 2012, 2015; McMillan, Gilbody, & Richards, 2010). Scores of 8 or 10 and higher have been recommended as thresholds for classifying ‘clinical caseness’ – when individuals score high enough on anxiety and/or depression measures to be classified as a clinical case (NHS, 2018).

Due to the nature of the intervention and assessment procedures, which include English language self-report questionnaires and scales, the ability to communicate in written and spoken English was an inclusion criterion. Individuals who reported minimal depressive and anxious symptoms (reported below an eight and 10 on the GAD-7 and PHQ-9, respectively) were excluded from this clinical trial. Individuals who self-reported and endorsed a history of substance abuse or dependence, psychosis or mania, self-injurious behaviour, or suicide attempts were provided with additional online screening questions specific to the endorsed history of mental health. This screening assisted in determining whether an individual was eligible for the study. Individuals who had current substance abuse or dependence were currently experiencing active psychosis or mania, had current suicidal ideation, were excluded prior to the study. Students were also excluded if they previously completed >4 weeks of an MBI or general CBT in the past 3 years. Participants were recruited between December 2018 and February 2019.



All participants who met inclusion criteria, selected a mindfulness group and attended scheduled sessions, received up to five sessions (90 minutes per session), over five weeks. Participants completed the baseline questionnaire battery and screener online (2 – 6 weeks prior to their first session). Participants completed additional questionnaire batteries administered by a research assistant (RA) in person at the beginning of session one (pre-intervention), at the beginning of session three (mid-intervention) and immediately following session five completion (post-intervention). The questionnaire was available online for five-days following each timepoint, for individuals who were not able to attend the session in which the questionnaires were distributed). The participants also complete a follow-up questionnaire online, one-month following the end of the intervention (they had access to complete this survey for two weeks, between the fourth and sixth week following post-intervention). Due to the logistics of providing an intervention for university students, the recruitment process necessarily extended over a variable time period (2 to 6 weeks). Therefore, the baseline measures were completed during this period of time.

To test variability in time between baseline and pre-measures, the covariate of wait period (number of days between baseline and pre-bMBI questionnaire completion) was included in LME analyses considering the main effect of time of wait period on primary and secondary outcomes. After holding covariates of age, URPP (credit or treatment seeking status), attendance (number of sessions attended), wait period, relationship status, employment status and mental health diagnosis constant, no significant main effects for time were found for any of the primary or secondary measures (Refer to Appendix A). Therefore, the covariate of wait period was not controlled for in subsequent analyses.

## Procedure

EA students (age 18 to 29; Arnett et al., 2014) who were: a) seeking course credits through the Department of Psychology undergraduate research participant pool (URPP), b) seeking treatment from the Student Accessibility Services, Mental Health Disability Services, or c) part of the York community (e.g., York Colleges system) and were interested in participating were recruited. The study details were posted on online portals and sent by email. All interested participants completed the initial consent form (see Appendix B), followed by a questionnaire package that included demographics, mood and anxiety related questions as well as other relevant clinical criteria (see Appendix C). The recruitment email letter and recruitment process are provided in Appendices D and E and, respectively.

The research team reviewed respondents' screener items for inclusion and exclusion criteria. If eligibility was confirmed, the RA emailed the participants notifying them about their eligibility for the five-week bMBI (Refer to Appendix D). If participants endorsed a mental health difficulty history, the RA followed up with further specific questions relevant to the endorsed history and a decision was made to include or exclude them from the study (Refer to Appendix F).

## Measures

The primary outcomes measured were depressive/anxious symptoms and mental well-being. The secondary outcome measures included perceived stress, ER, and self-compassion.

**Depressive Symptoms.** Level of depressive symptoms were measured with the original 9-item version of the Patient Health Questionnaire (PHQ-9; Kroenke et al., 2001). Participants ( $\geq 18$  years of age) were asked to indicate how many times they experienced each item over the past two weeks. Possible responses ranged from 0 (*Not at all*) to 4 (*Nearly every day*). These

items were summed to create a total depressive symptom score, with higher scores reflecting greater levels of depressive symptoms (total scores can range from 0 - 36). The PHQ-9 has good internal consistency (Cronbach  $\alpha = .85 - .89$ ), test-retest reliability ( $r = 0.84 - 0.89$ ) and good construct validity, across diverse university students, and primary care patient populations (Adewuya, Ola, & Afolabi, 2006; Keum, Miller, & Inkelas, 2018; Kroenke et al., 2001; Kroenke, Spitzer, Williams, & Löwe, 2010).

**Anxious Symptoms.** Level of anxious symptoms were measured with the original 7-item version of the Generalized Anxiety Disorder (GAD-7; Spitzer et al., 2006). Participants ( $\geq 18$  years of age) were asked to indicate how many times they experienced each item over the past two weeks. Possible responses ranged from 0 (*Not at all*) to 4 (*Nearly every day*). These items were summed to create a total anxious symptom score, with higher scores reflecting greater levels of anxious symptoms (total scores can range from 0 - 28). The GAD-7 has good to excellent internal consistency (Cronbach  $\alpha = .89 - .92$ ), good test-retest reliability ( $r = 0.83$ ) and good construct validity across the general population and primary care patient populations (Löwe et al., 2008; Spitzer et al., 2006).

**Mental Wellbeing.** A wide conception of Wellbeing – including affective-emotional aspects, cognitive-evaluative dimensions and psychological functioning – was measured using the 14-item Warwick-Edinburgh Mental Well-Being Scale (WEMWBS; Tennant et al., 2007). Participants ( $\geq 16$  years of age) were be asked to indicate how many times they experienced each item over the past two weeks. Possible responses range from 0 (*None of the time*) to 5 (*All of the time*). These items were summed to create a total Mental Wellbeing score, with higher scores reflecting higher levels of mental wellbeing (total scores can range from 14 - 70). This measurement tool was initially validated on a university student population and general

populations, and has been further validated in teenaged populations and secondary care mental health service user populations (Bass, Dawkin, Muncer, Vigurs, & Bostock, 2016; Clarke et al., 2011; Tennant et al., 2007). WEMWBS has good to excellent internal consistency (Cronbach  $\alpha = .89 - .95$ ), acceptable to excellent test-retest reliability ( $r = 0.66 - 0.83$ ), has been found to be unsusceptible to bias, and has good criterion, content and construct validity (Bass et al., 2016; Clarke et al., 2011; Tennant et al., 2007).

**Perceived Stress.** Psychological stress – “the degree to which individuals appraise situations in their lives as stressful” – was measured using the 10-item Perceived Stress Scale (PSS-10; Cohen, 1994, p. 4; Cohen, Kamarck, & Mermelstein, 1983). Participants were asked about their feelings and thoughts during the last month. Possible responses range from 0 (*Never*) to 4 (*Very Often*). These items were summed to create a total Perceived Stress score, with higher scores reflecting higher levels of psychological stress (total scores can range from 0 - 40). The most common population in psychometric studies of the PSS-10 comprised post-secondary students (Lee, 2012). PSS-10 has fair to excellent internal consistency (Cronbach  $\alpha = .74 - .91$ ), fair to good test-retest reliability ( $r = 0.74 - 0.88$ ), and has been validated in college populations (i.e., factorial, criterion, discriminant and convergent validity; Lee, 2012; Nunnally & Bernstein, 1994).

**Emotion Regulation.** Individuals’ tendency to regulate their emotions by way of Cognitive Reappraisal and/or Expressive Suppression was measured with the 10-item Emotion Regulation Questionnaire (ERQ; Gross & John, 2003). Participants were asked about how they control and manage their emotions (specifically internal emotional experience and external emotions), with possible responses ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). These items were summed to create separate scores for CR (total score can range from 6 to 42)

and ES (total score can range from 7 - 28). ERQ has fair internal consistency for both CR (Cronbach  $\alpha = .79 - .81$ ) and ES (Cronbach  $\alpha = .71 - .73$ ), fair test-retest reliability over two months ( $r_{\text{Suppression}} = .71$ ,  $r_{\text{Reappraisal}} = .67$ ), has demonstrated good construct validity, convergent and divergent validity in diverse populations, including post-secondary aged populations (Balzarotti, John, & Gross, 2010; Gross & John, 2003; Melka, Lancaster, Bryant, & Rodriguez, 2011).

**Self-Compassion.** Compassion toward self were measured using the 12-item Self-Compassion Scale – Short Form (SCS-SF; Raes, Pommier, Neff, & Van Gucht, 2011). Participants were asked how they typically act towards themselves in difficult times, with possible responses ranging from 1 (*Almost Never*) to 5 (*Almost Always*). A total score was calculated by taking the mean of the 12 items after reverse scoring negatively worded items, with higher scores reflecting higher levels of self-compassion (total scores can range from 12 - 60). The SCS-SF has good to excellent internal consistency (Cronbach  $\alpha = 0.85 - 0.92$ ), and has good construct validity; it has been validated in both clinical mood/anxiety populations and “healthy” post-secondary populations (Hayes, Lockard, Janis, & Locke, 2016; Kelly, Vimalakanthan, & Carter, 2014; Raes et al., 2011)

Participants also completed a demographics package, which provided control variable data, including but not limited to gender, age, relationship status etc. Participants completed a weekly home practice record package to note homework completion and practice time. Session attendance was recorded by a sign in sheet at the beginning of each session.

Students who endorsed one or more of the lifetime mental health difficulties outlined in the demographics history (i.e., Psychotic Symptoms, Manic or Hypomanic Symptoms, Alcohol or Substance Misuse, Suicide Attempt, Self-Harm Behaviour) were provided additional brief

questionnaires relevant to the items endorsed (Refer to Appendix E). These psychometrically reliable and valid brief measures included “The 16-item Version of the Prodromal Questionnaire (PQ-16)” for psychosis screening (Ising et al., 2012), “The Drug Abuse Screening Test (DAST-10)” and “Alcohol Use Disorders Identification Test - Consumption (AUDIT-C)” for substance abuse or dependence screening (Barry, Chaney, Stellefson, & Dodd, 2015; Yudko, Lozhkina, & Fouts, 2007), as well as the “Mood Disorder Questionnaire” for (Hypo)mania (Boschloo et al., 2013) for (hypo)mania screening.

### **Study Intervention**

The intervention was a five-week (consecutive) transdiagnostic group-based bMBI (Mindfulness-based Therapy for Emerging Adults), adapted by psychiatrist, Dr. Steven Selchen, for adult outpatient mood and anxiety populations. I ran all intervention group sessions, with groups including 4 to 15 participants. The five intervention session titles and themes were as follows; Week 1 – Cultivating Awareness (including handouts and daily home-practice recording sheets), Week 2 – Relating to Experience: Reacting or Responding? (including handouts and daily home-practice recording sheets), Week 3 – Caring for Ourselves, Week 4 – Making Moments (including handouts and daily home-practice recording sheets), and Week 5 – Continuing the Practice (including handouts and daily home-practice recording sheets).

Each session was 90 minutes in length, and included approximately 30 minutes facilitated meditation, approximately 30 minutes of experiential, group-based discussion and approximately 30 minutes of psychoeducational didactical learning. The early sessions introduced students to mindfulness, moment-to-moment awareness, and emotions. The later sessions focused on acceptance, our manners of orienting to the world and how different ways we interact with the world may be helpful or unhelpful. I created and provided two audio

recordings for home-practice at session one (Cultivating Awareness) and session three (Cultivating Awareness: Deepening the Practice).

### **Statistical Analysis Strategy**

RStudio version 1.2 was used to conduct all analyses for the current study. All participants who attended at least three of five sessions, and completed the baseline, pre-intervention and at least one of the subsequent questionnaires were included in the analyses. After data cleaning, the psychometric properties of the measures at each timepoint were examined (see Appendix G). The GAD-7 (Cronbach  $\alpha = .82 - .90$ ) and WEMWBS (Cronbach  $\alpha = .89 - .94$ ) had good to excellent internal consistency, the PHQ-9 (Cronbach  $\alpha = .78 - .97$ ) and ERQ: Suppression (Cronbach  $\alpha = .73 - .90$ ) had acceptable to excellent reliability, and the SCS-SF (Cronbach  $\alpha = .82 - .85$ ) and ERQ: Reappraisal (Cronbach  $\alpha = .85 - .89$ ) had good internal reliability. The PSS-10 (Cronbach  $\alpha = .59 - .87$ ) had a poor to good internal consistency, consistent with the literature on the reliability of the measure.

To directly examine the predictions relating to change on the primary outcomes (anxious symptoms, depressive symptoms, and mental wellbeing) and secondary outcome (perceived stress, emotion regulation, mindfulness, self-compassion), I conducted a series of linear mixed-effects (LME) models. LME models are used for longitudinal repeated measure data to gain a better understanding of within-individual differences in the development of health related outcomes among EAs over time (Chen, Curran, Bollen, Kirby, & Paxton, 2008; Curran, Obeidat, & Losardo, 2010a). Longitudinal studies that use multilevel approaches, capitalize on repeated-measurement sampling to examine within-individual change in psychological variables overtime. From this, it could be determined whether individual level patterns of these psychological variables generalize to groups within a larger population, through considering specific variables

overtime, and estimates of random effects, slope and intercept variability. This approach is able to handle missing data, adjusting estimates for any missing data points and integrating the data available for all participants (Fortney, Luchterhand, Zakletskaia, Zgierska, & Rakel, 2013). This analysis approach is recommended, as it eliminates the issue of excluding whole participants data and the unnecessary loss of sample size or reduced power (Anticich et al., 2013; McKnight, McKnight, Sidani, & Figueredo, 2007), as well as producing less biased estimates.

To understand the clinical effect of the statistical LME outputs, clinical effect sizes were calculated. Effect sizes were calculated comparing pre-intervention scores to those at post-intervention, one-month follow-up, as well as post-intervention and one-month follow-up, using Cohen's  $D = (\text{Mean time 2} - \text{Mean time 1}) / \text{Pooled SD}$  (Carlson, Speca, Faris, & Patel, 2007). In keeping with Cohen's (1988) standards, an effect of .2 is described as small, .5 is medium and .8 is large (Cohen, 1988).

This analysis allowed us to test whether different timepoint pairings (baseline to pre-intervention vs. pre-intervention to post-intervention / to one-month follow-up) have a different intercept (level) and slope between time, and linear change overtime, while controlling for other factors.

For the secondary hypotheses (pre-intervention predictors), I used LMEs that incorporated pre-intervention perceived stress, pre-intervention self-compassion and the interaction of depressive symptoms (by both predictors), anxious symptoms (by both predictors) and wellbeing (by both predictors) to create different trajectories of change. Residual maximum likelihood (REML) estimation for missing data were used to consider any multivariate non-normality present in the data. When significant interactions were found, we probed the interaction by calculating simple slopes. To determine a sensible set of "low", "medium" and



“high” value, we utilized the R Studio function *simple slopes*, which computes simple slopes for a low (one standard deviation below the mean), medium (the mean) and a high (one standard deviation above the mean) value of the predictor variable.

### **Sample Size**

The current study recruited a total of 55 participants. Since the current study data were analyzed through LME modelling (Refer to Statistical Analysis Strategy section below), an adequate sample size was needed to reliably estimate the models; however, what constitute adequate is not easily determined; there are limited methods of estimating statistical power (Curran, Obeidat, & Losardo, 2010b). The complex nature of determining the necessary sample size required for linear mixed effects modelling is due to both the complexity of a model and the variance that can be explained by the model. Although a sample size approaching 100 is commonly preferred, models have been fit to samples as small as 22 (Curran et al., 2010b; Huttenlocher, Haight, Bryk, Seltzer, & Lyons, 1991). Typically, models require three or more repeated measures per participant (the current study comprised five timepoints). There is a close relationship between number of individuals required in a study and the number of repeated observations (person-by-time observations; (Muthén & Curran, 1997). Curran, Obeidate and Losardo et al. (2010) suggested that LME models “may be fitted to many types of sample data structures, although care must be taken in the selection of proper models and methods of estimation that maximally correspond to the characteristics of the given data set”. With these considerations, a sample size of 72 to 180 participants (total) has been suggested as an adequate sample, based off these considerations.

### Chapter 3: Results

Baseline demographic characteristics and descriptive are summarized in Table 1 below, using numerical values, means, standard deviations, and distributions using percentages. Fifty-four individuals were recruited (attended their first scheduled session), with an average attendance rate of 3.89 ( $SD = 1.40$ ) out of five sessions. At the beginning of session two of the groups, the retention rate was 83.33% (eight participants withdrew from the program after session one). At the end of the five-week interventions, a total of 45 (79.60%) of initial recruited participants remained (two participants withdrew following session three).

Table 1

*Baseline Characteristics*

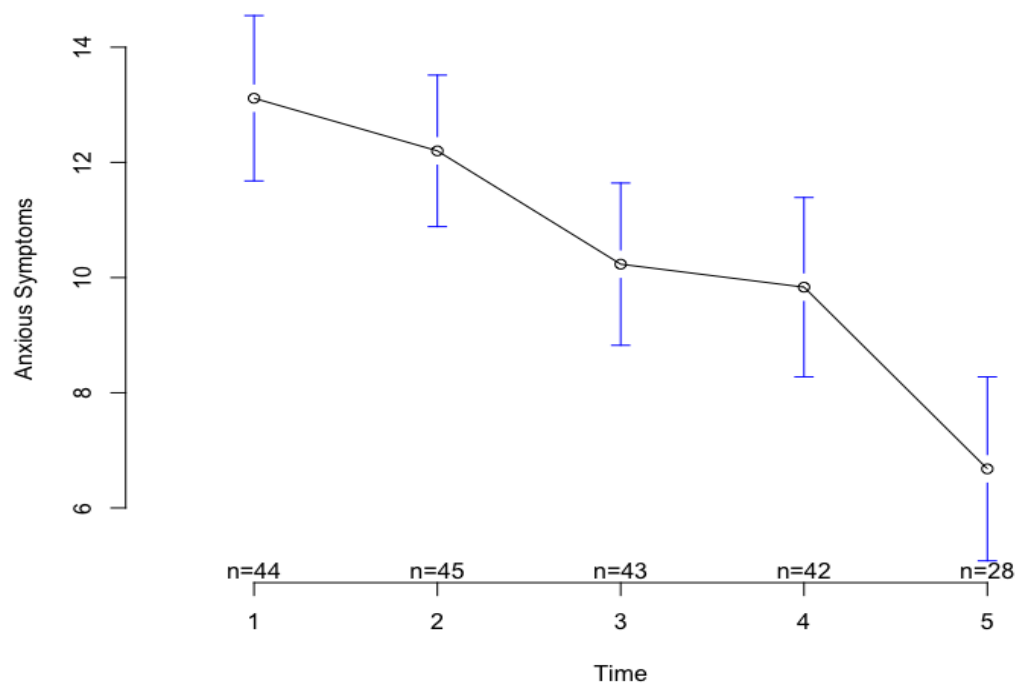
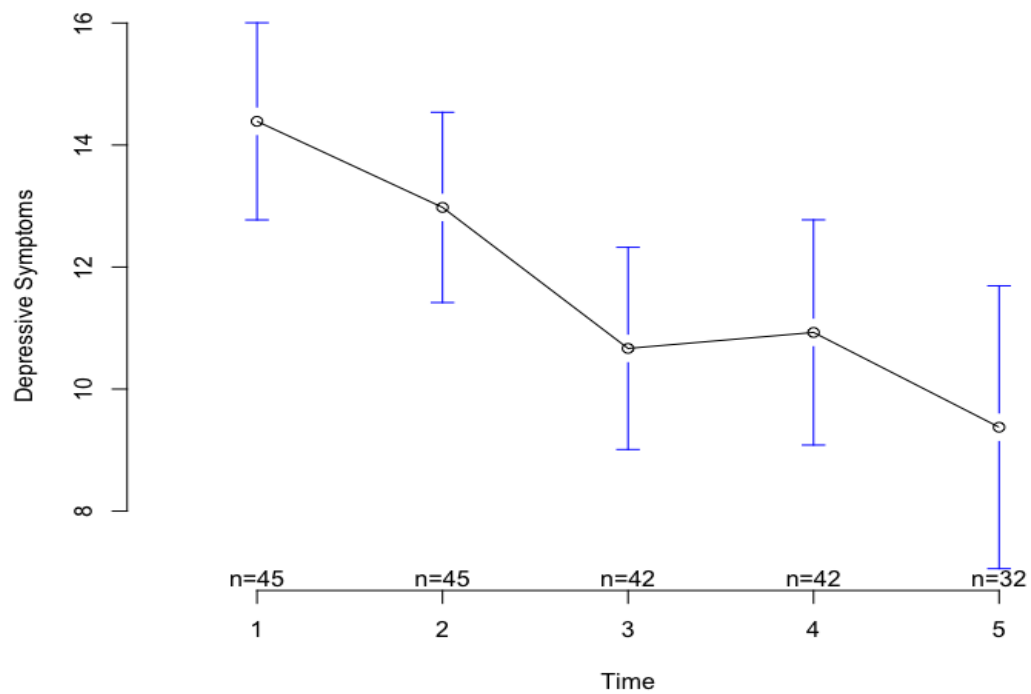
	<b>bMBI participants (N = 45)</b>
<b>Total Sample</b>	
Respondents at T1	45 (100%)
Respondents at T2	45 (100%)
Respondents at T3	42 (93%)
Respondents at T4	42 (93%)
Respondents at T5	32 (71.11%)
<b>Age, mean (SD)</b>	20.59 (2.57)
<b>Gender, % female</b>	41 (91%)
<b>Ethnicity</b>	
Asian	11 (24.44%)
Black	3 (6.67%)
Caucasian	8 (17.78%)
Hispanic	4 (8.89%)
Indigenous	1 (2.22%)
Middle Eastern	5 (11.11%)
Other	6 (13.33%)
South Asian	5 (11.11%)
West Indies	2 (4.44%)
<b>Academic Year</b>	
First Year	21 (46.67%)
Second Year	11 (24.44%)
Third Year	9 (20%)
Fourth Year	2 (4.44%)
Fifth Year	2 (4.44%)
<b>Mental Health Diagnosis?</b>	
Yes	8 (17.78%)
Uncertain	3 (6.66%)
No	34 (75.56%)
<b>Employment</b>	
Part- or Full-Time Employed	32 (71.11%)
Unemployed	13 (28.89%)
<b>In a Committed Relationship</b>	20 (44%)

Means and standard deviations for all measures are presented in Table 2. Means and confidence intervals for all measures are presented in Figure 6 – 12. Pearson correlations were computed to examine the strength of association between the independent and dependent variables (see Appendix H). Outliers and influential cases were considered via normality of residuals and influence values. Outliers were treated by deletion. Overall, the residuals were normally distributed and cases were not excessively influential. Although this sample was relatively small, there were no cases that would be considered excessively influential (Cook’s distance of cases were <0.5) – that would increase parameter estimate standard errors – nor extreme (most standardized residual values fell between approximately -2 and +2) (Field, 2013).

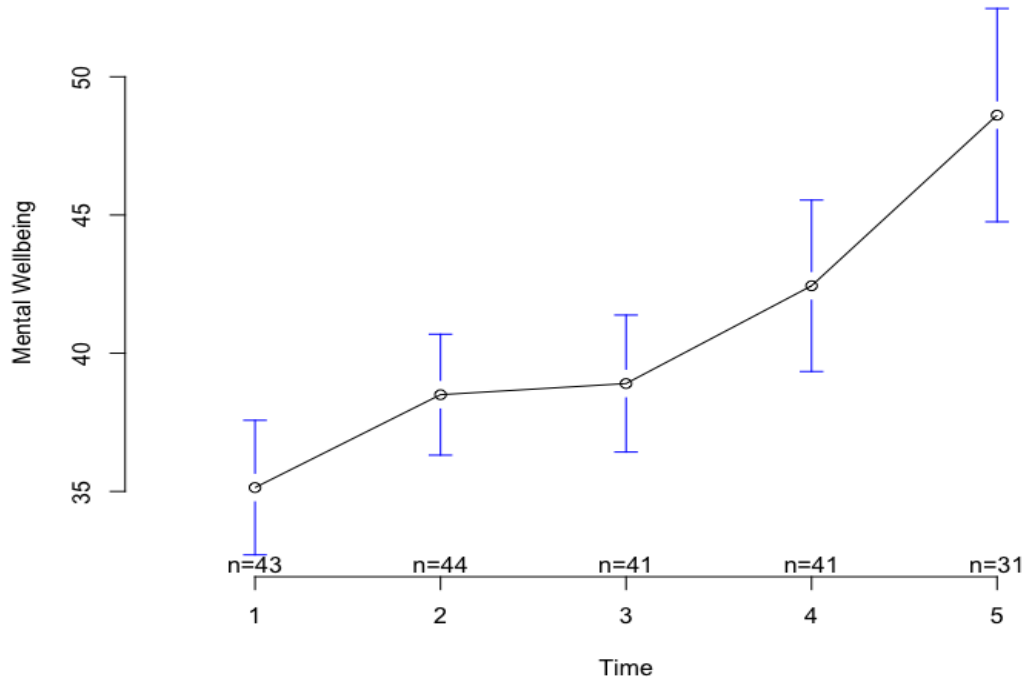
Table 2

*Summary of Means, and Standard Deviations for Anxious Symptoms, Depressive Symptom, Mental Wellbeing, Self-Compassion Perceived Stress, Reappraisal, and Suppression*

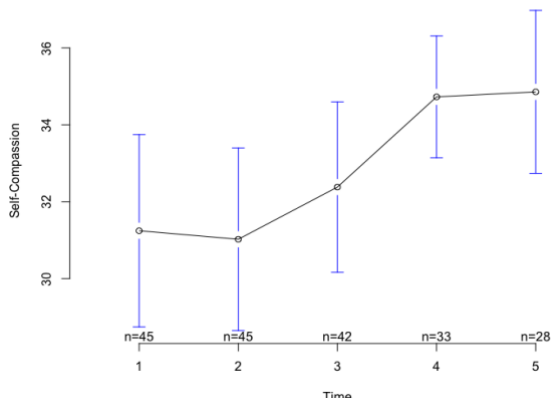
Measure	Time 1 (Baseline)		Time 2 (Pre-bMBI)		Time 3 (Mid-bMBI)		Time 4 (Post-bMBI)		Time 5 (1-month FU)	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Anxious Symptoms	13.11	4.72	12.2	4.38	10.23	4.58	9.83	5.00	6.68	4.12
Depressive Symptoms	14.39	5.38	12.99	5.19	10.67	5.32	10.93	5.92	9.38	6.43
Mental Wellbeing	35.14	7.91	38.50	7.20	38.90	7.85	42.44	9.82	48.61	10.52
Self-Compassion	31.24	8.33	31.02	7.91	32.38	7.11	34.73	4.47	34.86	5.47
Perceived Stress	25.43	5.20	25.16	3.52	23.24	4.47	23.15	5.79	20.69	5.36
Reappraisal	26.86	7.55	26.76	4.50	25.37	6.44	27.34	7.05	28.96	3.56
Suppression	16.38	6.41	15.42	5.02	15.40	5.46	14.95	6.16	14.76	6.43

**Figure 6. Anxious Symptoms by Time****Figure 7. Depressive Symptoms by Time**

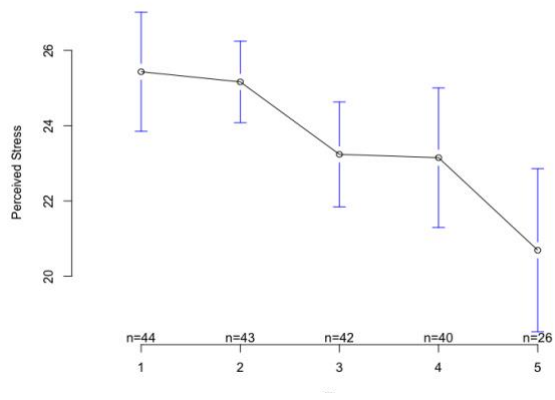
**Figure 8. Mental Wellbeing by Time**



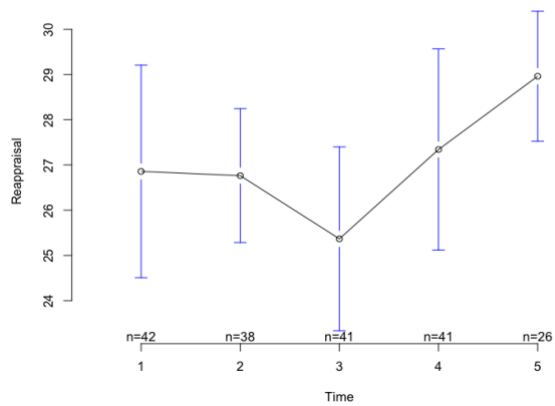
**Figure 9. Self-Compassion by Time**



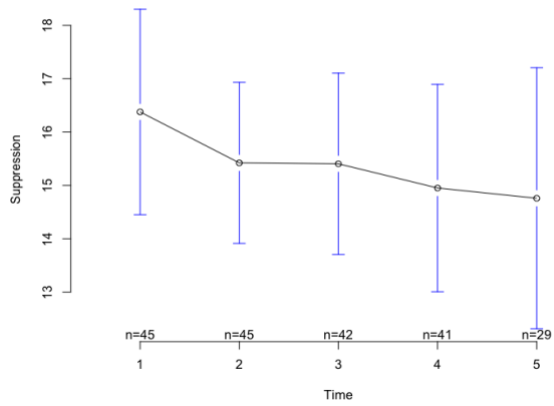
**Figure 10. Perceived Stress by Time**



**Figure 11. Reappraisal by Time**



**Figure 12. Suppression by Time**



## Does the brief mindfulness intervention have an effect on primary and secondary outcomes?

The first hypothesis focused on the main effect of time on the outcome variables over the course of the intervention. There was a strong statistical main effect of time and a small to medium clinical effect for all primary outcomes (see Table 3). Participants' depressive and anxious symptom scores decreased over the intervention period and their mental wellbeing scores improved. As can be seen in Table 3, there was a strong statistical main effect of time and a small to medium clinical effect for two of the four secondary outcomes, self-compassion and perceived stress. Self-compassion scores improved and perceived stress scores decreased over the intervention period. No significant main effect of time was found for the emotion regulation outcomes, suppression and reappraisal.

Table 3

*Linear Mixed Effects Model of the Effects of Time (Pre- to post-treatment) on Anxious Symptoms, Depressive Symptom, Mental Wellbeing, Self-Compassion Perceived Stress, Reappraisal, and Suppression*

Outcomes	Time 2 (Pre-bMBI)		Time 4 (Post-bMBI)		<i>B</i>	$\beta$	<i>SE</i> ( $\beta$ )	<i>p</i>	95% CI for $\beta$	<i>ES</i> <i>d</i>
	Mean	<i>SD</i>	Mean	<i>SD</i>						
Anxious Symptoms	12.2	4.38	9.83	5.00	-1.17	-0.25	0.09	0.01	-0.42, -0.07	0.50
Depressive Symptoms	12.99	5.19	10.93	5.92	-1.05	-0.19	0.07	0.01	-0.33, -0.04	0.37
Mental Wellbeing	38.50	7.20	42.44	9.82	1.83	0.21	0.08	0.02	0.08, 0.41	0.46
Self-Compassion	31.02	7.91	34.73	4.47	1.71	0.25	0.08	0.00	0.61, 2.82	0.58
Perceived Stress	25.16	3.52	23.15	5.79	-1.02	-0.21	0.09	0.03	-0.40, -0.03	0.42
Reappraisal	26.76	4.50	27.34	7.05	0.28	0.05	0.08	0.53	-0.11, 0.20	0.10
Suppression	15.42	5.02	14.95	6.16	-0.91	0.16	0.45	0.72	-1.08, 0.75	0.08

*ES* = (Mean time 4 - Mean time 2) / Pooled *SD*

### Are the effects of the brief mindfulness intervention sustained over a one-month period?

To test for maintenance of treatment gains, the second part of the main hypothesis focused on the main effect of time on the outcome variables from pre-intervention to one-month post intervention (see Table 4). Controlling for covariates, there was a strong statistical main effect of time and medium to large clinical effect for all primary outcomes. The gains in depressive and anxious symptom scores and in mental wellbeing improved from the beginning of the intervention and were maintained through the one-month follow-up period. There was also a strong statistical main effect of time and medium to large clinical effect for secondary measures of self-compassion, perceived stress and reappraisal. Perceived stress symptom, self-compassion, and reappraisal scores improved from the beginning of the intervention and were maintained through the one-month follow-up period. Consistent with the lack of pre- post-intervention effects, there was no significant main effect of time was found for suppression at follow-up.

Table 4

*Linear Mixed Effects Model of the Effects of Time (Pre- to one-month follow-up) on Anxious Symptoms, Depressive Symptom, Mental Wellbeing, Self-Compassion Perceived Stress, Reappraisal, and Suppression*

Outcomes	Time 2 (Pre-bMBI)		Time 5 (1 Month FU)		<i>B</i>	$\beta$	<i>SE</i> ( $\beta$ )	<i>p</i>	95% CI for $\beta$	<i>ES</i>
	Mean	<i>SD</i>	Mean	<i>SD</i>						
Anxious Symptoms	12.2	4.38	6.68	4.12	-1.87	-0.56	0.08	0.00	-0.73, -0.39	1.30
Depressive Symptoms	12.99	5.19	9.38	6.43	-1.30	-0.33	0.08	0.00	-0.49, -0.17	0.62
Mental Wellbeing	38.50	7.20	48.61	10.52	3.28	0.49	0.09	0.00	-0.31, 0.68	1.12
Self-Compassion	31.02	7.91	34.86	5.47	1.41	0.29	0.08	0.00	0.13, 0.45	0.56
Perceived Stress	25.16	3.52	20.69	5.36	-1.50	-0.47	0.11	0.00	-0.70, -0.25	0.99
Reappraisal	26.76	4.50	28.96	3.56	0.63	0.22	0.10	0.04	0.01, 0.44	0.54
Suppression	15.42	5.02	14.76	6.43	-0.21	-0.06	0.07	0.45	-0.21, -0.06	0.11

*ES* = (Mean time 5 - Mean time 2) / Pooled *SD*



### Are there latent effects of the brief mindfulness intervention from post-intervention over the one-month follow-up period?

To test for continuing improvement in primary and secondary outcomes, the third part of the main hypothesis focused on the main effect of time from post-intervention to one-month follow up (see Table 5). Controlling for age, URPP (credit or treatment seeking status), attendance (number of sessions attended), relationship status, employment status and mental health diagnosis, there was a strong statistical main effect of time and medium clinical effect for anxious symptoms and mental wellbeing. This indicates that anxious symptom and wellbeing scores continued to improve from the end of the intervention to one month following. There was also a strong statistical main effect of time and small clinical effect for improvement in perceived stress. No significant main effect of time was found for self-compassion, reappraisal and suppression.

Table 5

*Linear Mixed Effects Model of the Effects of Time (Post- to one-month follow-up) on Anxious Symptoms, Depressive Symptom, Mental Wellbeing, Self-Compassion Perceived Stress, Reappraisal, and Suppression*

Outcomes	Time 4 (Post-bMBI)		Time 5 (1 Month FU)		<i>B</i>	$\beta$	<i>SE</i> ( $\beta$ )	<i>p</i>	95% CI for $\beta$	<i>ES</i> <i>d</i>
	Mean	SD	Mean	SD						
Anxious Symptoms	9.83	5.00	6.68	4.12	-3.16	-0.07	0.12	0.02	-0.52, -0.13	0.77
Depressive Symptoms	10.93	5.92	9.38	6.43	-1.84	-0.15	0.08	0.09	-0.33, 0.02	0.26
Mental Wellbeing	42.44	9.82	48.61	10.52	6.09	0.29	0.08	0.00	0.14, 0.44	0.61
Self-Compassion	34.73	4.47	34.86	5.47	0.22	0.02	0.08	0.79	-0.15, 0.19	0.03
Perceived Stress	23.15	5.79	20.69	5.36	-2.40	-0.21	0.09	0.03	-0.40, -0.02	0.45
Reappraisal	27.34	7.05	28.96	3.56	2.26	0.19	0.09	0.05	-0.00, 0.38	0.29
Suppression	14.95	6.16	14.76	6.43	0.07	0.01	0.05	0.10	-1.32, 1.44	0.03

*ES* = (Mean time 5 - Mean time 4) / Pooled SD

### **The moderating roles of self-compassion on the improvements through the mindfulness-based intervention**

The first part of the secondary hypothesis focused on testing self-compassion as a moderator for the improvements from pre- to mid-, post-intervention and one-month follow-up to examine whether those with lower initial self-compassion showed greater improvements than those with higher initial self-compassion scores.

**Pre- to Mid-Intervention.** Pre-intervention self-compassion scores significantly moderated the relationship of time (pre- to mid-intervention), anxious symptoms (see Table 6). The interaction was probed by testing the conditional effects of anxious symptoms at three levels of self-compassion, low (one standard deviation below the mean), medium (at the mean), and high (one standard deviation above the mean). Self-compassion scores at mid-intervention were significantly related to anxious symptom reduction when self-compassion scores at pre-intervention were medium ( $p > 0.01$ ) and high ( $p > 0.00$ ), but not when their scores were low ( $p < 0.94$ ) (see Figure 13 and Table 7). Pre-intervention self-compassion scores did not significantly moderate improvements of depressive symptoms or mental wellbeing symptoms.

Table 6

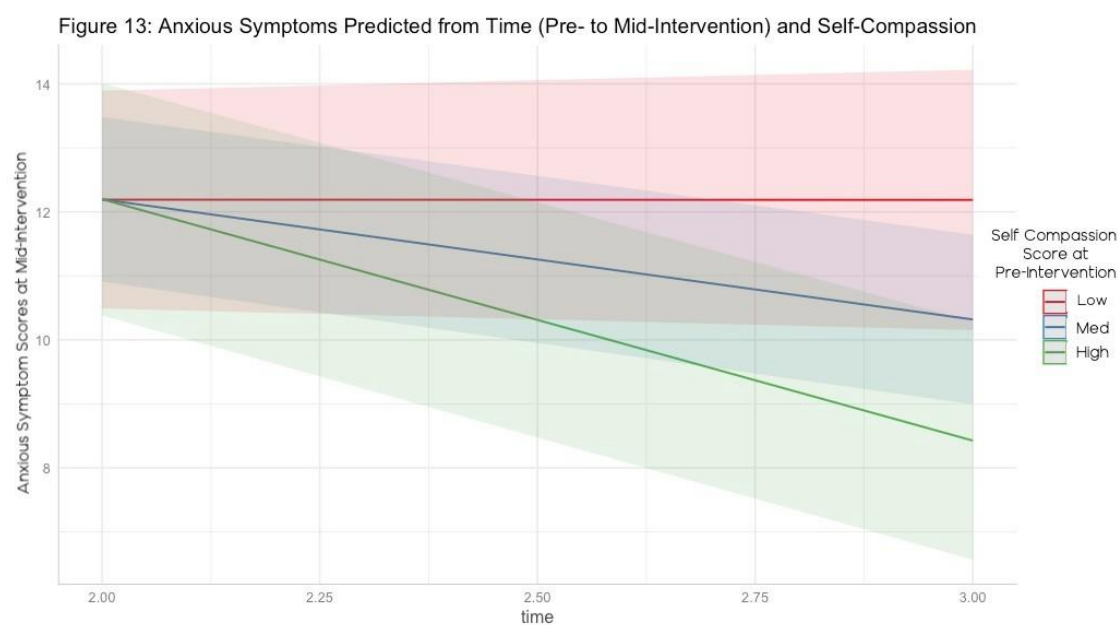
*Anxious Symptoms, Depressive Symptoms and Mental Wellbeing Predicted from Time (Pre- to Mid-Intervention) and Self-Compassion*

Predictor	<i>B</i>	$\beta$	<i>SE</i> ( $\beta$ )	<i>p</i>	95% CI for $\beta$
Anxious Symptoms (Time)	6.50	-0.21	0.08	0.05	-0.37, -0.05
Anxious Symptoms (Compassion)	0.54	-0.21	0.13	0.04	-0.47, 0.06
Anxious Symptoms (Time x Compassion)	-0.27	-0.22	0.08	0.01	-0.39, -0.05
Depressive Symptoms (Time)	3.59	-0.19	0.08	0.34	-0.35, -0.03
Depressive Symptoms (Compassion)	0.33	-0.17	0.13	0.27	-0.44, 0.10
Depressive Symptoms (Time x Compassion)	-0.18	-0.13	0.08	0.13	-0.29, 0.04
Mental Wellbeing Symptoms (Time)	-6.64	0.01	0.08	0.24	-0.15, 0.17
Mental Wellbeing Symptoms (Compassion)	-0.17	0.37	0.11	0.70	0.14, 0.60
Mental Wellbeing Symptoms (Time x Compassion)	0.21	0.11	0.09	0.22	-0.07, 0.28

Table 7

*Conditional Effects of Mid-Intervention on Anxious Symptoms*

Self-compassion	<i>B</i>	<i>SE</i> ( <i>B</i> )	<i>p</i>
Low	0.08	1.02	0.94
Medium	-1.91	0.71	0.01
High	-3.91	1.03	0.00



**Pre- to Post-Intervention.** Pre-intervention self-compassion scores significantly moderated the relationship of time (pre- to post-intervention), anxious symptoms, depressive symptoms, and mental wellbeing (see Table 8). The interactions were probed by testing the conditional effects of anxious, depressive and mental wellbeing at three levels of self-compassion, low (one standard deviation below the mean), medium (at the mean), and high (one standard deviation above the mean).

As shown in Table 9 and Figure 14, pre-intervention self-compassion scores and time was significantly related to anxious symptom reduction at post-intervention when self-compassion scores at pre-intervention were high ( $p > 0.00$ ), but not when their pre-intervention scores were low ( $p < 0.30$ ) or medium ( $p > 0.07$ ). As shown in Table 10 and Figure 15, self-compassion scores at pre-intervention were significantly related to depressive symptom reduction at post-intervention when self-compassion scores at pre-intervention were high ( $p > 0.00$ ), but not when their scores were low ( $p > 0.06$ ) or medium ( $p > 0.60$ ) at pre-intervention. As shown in Table 11 and Figure 16, self-compassion scores at pre-intervention were significantly related to mental wellbeing increases at post-intervention when self-compassion scores at pre-intervention were high ( $p > 0.02$ ), but not when their scores were low ( $p < 0.15$ ) or medium at pre-intervention ( $p > 0.75$ ).

Table 8

*Anxious Symptoms, Depressive Symptoms and Mental Wellbeing Predicted from Time (Pre- to Post-Intervention) and Self-Compassion*

Predictor	<i>B</i>	$\beta$	<i>SE(B)</i>	<i>p</i>	95% CI for $\beta$
Anxious Symptoms (Time)	7.00	-0.16	0.09	0.02	-0.35, 0.02
Anxious Symptoms (Compassion)	0.51	-0.28	0.14	0.02	-0.56, -0.01
Anxious Symptoms (Interaction)	-0.24	-0.34	0.12	0.01	-0.59, -0.10
Depressive Symptoms (Time)	8.80	-0.04	0.08	0.01	-0.20, 0.12
Depressive Symptoms (Compassion)	0.57	-0.32	0.13	0.02	-0.59, -0.05
Depressive Symptoms (Interaction)	-0.89	-0.34	0.11	0.00	-0.56, -0.12
Mental Wellbeing Symptoms (Time)	-9.96	0.02	0.08	0.04	-0.14, 0.19
Mental Wellbeing Symptoms (Compassion)	-0.35	0.46	0.12	0.31	0.21, 0.71
Mental Wellbeing Symptoms (Interaction)	0.31	-0.01	0.12	0.03	0.03, 0.25

Table 9

*Conditional Effects of Post-Intervention on Anxious Symptoms*

Self-compassion	<i>B</i>	<i>SE(B)</i>	<i>p</i>
Low	0.85	0.81	0.30
Medium	-0.78	0.43	0.07
High	-2.42	0.61	0.00

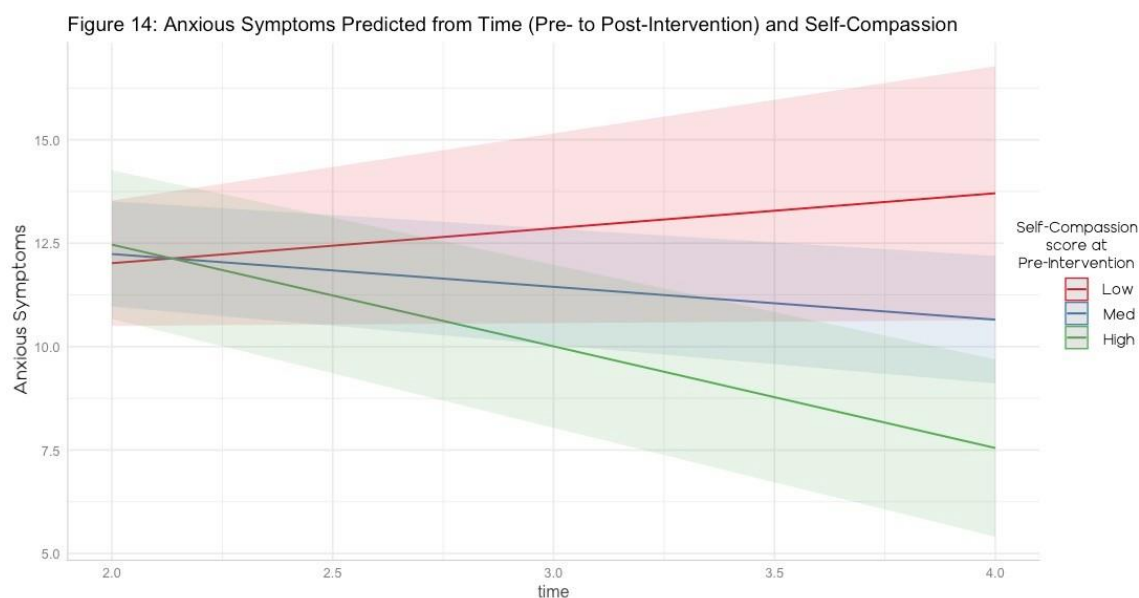


Table 10

*Conditional Effects of post-intervention on depressive symptoms*

Self-compassion	<i>B</i>	<i>SE(B)</i>	<i>p</i>
Low	1.67	0.85	0.06
Medium	-0.24	0.44	0.60
High	-2.15	0.63	0.00

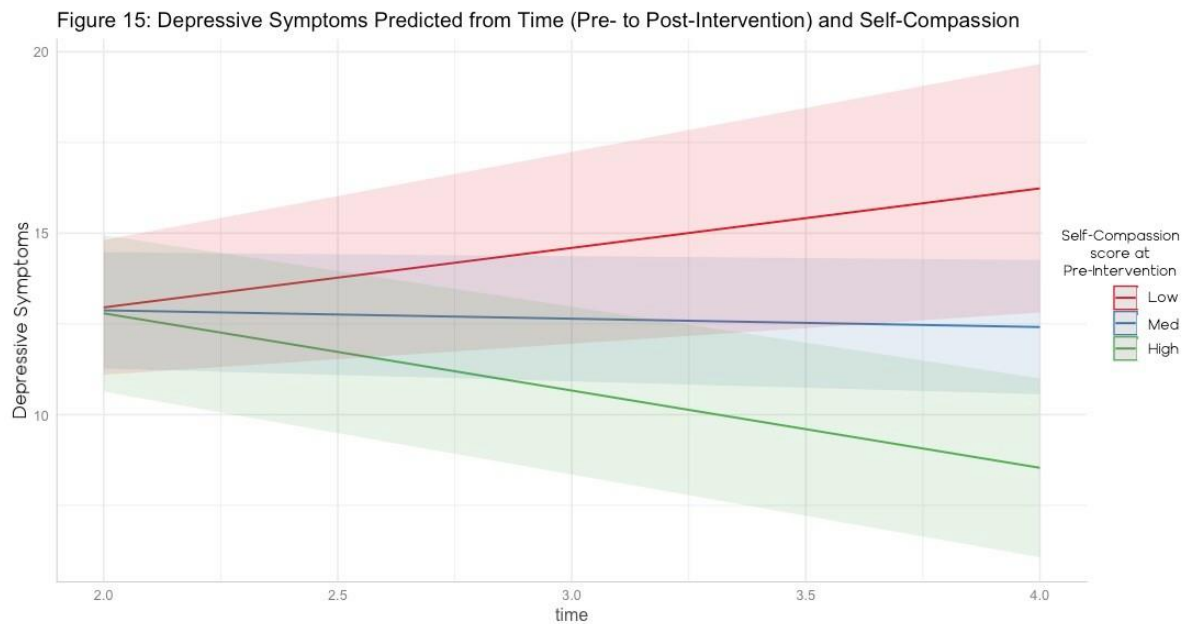
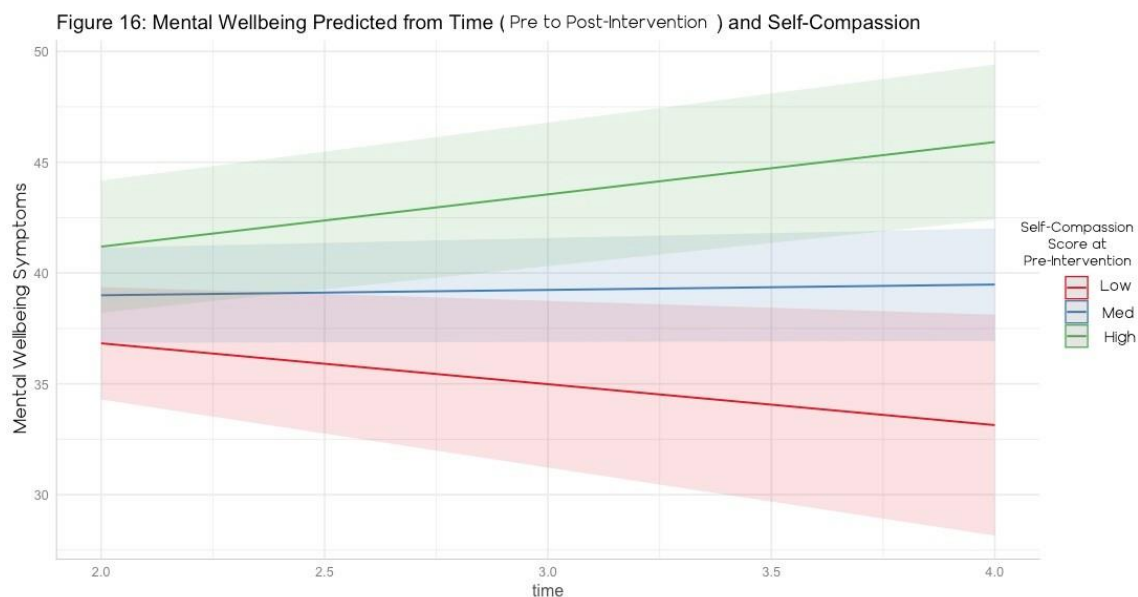


Table 11

*Conditional Effects of post-intervention on mental wellbeing*

Self-compassion	<i>B</i>	<i>SE(B)</i>	<i>p</i>
Low	-1.94	1.30	0.15
Medium	0.21	0.69	0.75
High	2.36	0.97	0.02



**Pre- to One-month follow-up.** Time and self-compassion were not significantly related to anxious and depressive symptom or mental wellbeing scores at one-month follow-up, and self-compassion did not significantly moderate those relationships.

### **The moderating role of perceived stress on the improvements through the mindfulness-based intervention**

The second part of the secondary hypothesis focused on testing perceived stress as a moderator for the improvements from pre- to post-intervention and one-month follow-up to examine whether those with higher initial perceived stress showed greater improvements than those with low initial perceived stress scores. Pre-intervention perceived stress scores did not significantly moderate the relationship between anxious symptoms and time, depressive symptoms and time, or mental wellbeing and time, at pre- to mid-intervention, pre- to post-intervention, or pre-intervention to one-month follow-up.

## Chapter 4: Discussion

This study focused on the efficacy of a brief mindfulness-based intervention for university undergraduate students. The results of this preliminary analysis of improvements from pre- to post- intervention and one-month follow-up indicated that this five-week bMBI for emerging adults (18 to 25 years old) was efficacious in decreasing anxious symptoms and depressive symptoms and maintaining these improvements at one month follow-up. The effect-size was small to large ( $d = 0.37 - 1.30$ ), which represents the middle to upper range of clinically significant improvement. Clinical effect-size and statistical significance strengthened overtime, with both anxious and depressive symptom means steadily reducing overtime, indicative of a clinically efficacious and sustainable brief intervention. No significant change was observed between the baseline to pre-intervention wait period.

With anxious and depressive symptom means of 12.2 and 12.98, respectively, this sample of participants scored, on average, high enough to be classified as clinical cases at pre-intervention (Grant et al., 2014; Jacobson & Truax, 1991). At follow-up, anxious and depressive symptom means of 6.68 and 9.38 for anxiety and depression did not meet clinical caseness. This notable reduction was further reflected by the finding that 50% of respondents at follow-up no longer met clinical caseness for both anxious and depressive symptoms, and 62.50% of respondents no longer met criteria for one of these mental health problems at follow-up (see Appendix I). When considering treatment responsiveness - based on the standard IAPT Reliable Change Index (drop of 6 points for the PHQ-9 or a drop of 5 points for the GAD-7 (Jacobson & Truax, 1991) - 35.71% of participants responded (experienced significant drop on at least one symptom) to treatment at post-intervention and this increased to 56.25% of participants at one month follow-up (Grant et al., 2014). Taken together, clinical caseness and response findings



further illustrate the efficacy of this preventative early stage mental health bMBI in reducing elevated psychological distress and enhancing coping among EAs.

Although both anxious and depressive symptoms decreased throughout this intervention, larger clinical effects were evident in anxious scores across the intervention. Similarly, while depressive symptom reductions were stable during the follow-up period, anxious symptoms continued to decrease significantly, suggestive of greater intervention efficacy for anxious symptoms in this emerging adult student group. Previous research has supported clinical efficacy of brief psychotherapeutic interventions (e.g., CBT and MBCT) in improving mood and anxious symptoms, but clinical effects of these interventions were modest ( $d= 0.25 - 0.45$ ), with the exception of brief CBT for anxiety, which had comparable effect sizes (Cape, Whittington, Buszewicz, Wallace, & Underwood, 2010; Hunsley, Elliott, & Therrien, 2013; Nieuwsma et al., 2012). In general, the current preliminary evaluation of bMBI with medium to large clinical effects illustrate the efficacy of this intervention for reduction of psychological distress in this EA student group. In line with the previous meta-analyses, it appears that this bMBI also had notably stronger effects for anxious symptoms than depressive symptoms.

Mental wellbeing also improved throughout the study, with small ( $d=0.46$ ) and large ( $d=1.12$ ) effect sizes at post-intervention and one month follow-up, respectively. In line with the anxious symptom findings, mental wellbeing also continued to improve, with clinically significant improvements at one month follow-up. On average, participants who waited longer to receive the intervention pre-intervention reported reduced well-being at the beginning of the intervention. This finding is in line with the emerging adulthood literature, with further support for improvements in mental wellbeing during and following a mindfulness intervention (Galante et al., 2018; Roulston, Montgomery, Campbell, & Davidson, 2018)

During the bMBI, participants' self-compassion scores increased, with large clinical effects at the end of the intervention; these clinical gains were maintained at one-month follow-up. In line with Roeser and Eccles's developmental trajectories of compassion and mindfulness model, the emerging adults in the present study were able to develop lasting self-compassion (reduced automaticity, mindlessness, and self-criticalness) through sustained, intentional practice (Roeser & Eccles, 2015). In line with the relevant literature, increases in self-compassion are strongly associated with psychological wellbeing and decreased distress. Self-compassion and mindfulness have been theorized to have a reciprocal relation with an iterative process that leads to improved empathy and emotional wellbeing (Birnie, Speca, & Carlson, 2010; Bluth & Blanton, 2014; Neff, 2009).

Throughout the intervention, mean perceived stress scores decreased in clinically and statistically significant ways and continued to decrease over the follow-up period. Perceived stress scores at pre-intervention ( $M=25.05$ ) were notably elevated, compared to an account from a 2012 study by Cohen and Janicki-Deverts (2012) indicating that mean perceived stress scores of individuals under the age of 25 have fluctuated over the decades from 14.5 in 1983, 18.6 in 2006 and 16.7 in 2009. The robust and continued reductions in perceived stress in a group of emerging adult students with a high stress burden supports the Mindfulness-Stress Buffering Model and supports brief and traditional cognitive, behavioral, and mindfulness interventions being made widely available to post-secondary students (Regehr, Glancy, & Pitts, 2013). This significant continuing decrease in perceived stress is consistent with previous literature and provides preliminary evidence of the efficacy of a brief, five-session MBI for emerging adults. The shortened, five-week, intervention showed maintenance effects that were comparable to a traditional eight-week mindfulness intervention for clinical populations (Carmody & Baer, 2008;

Chiesa & Serretti, 2009). Reduction in symptom scores following the intervention may indicate that even with a shortened intervention, there is adequate time for skill and knowledge acquisition through a bMBI.

The current study had a 79.6% retention (20.2% dropout) rate, similar to that in the literature showing on average a 19% dropout rate for depression and 15% for anxiety treatment approaches (Swift & Greenberg, 2014). This attrition rate is also lower than the average attrition rate found for mindfulness-based interventions (29%) and does not notably exceed the 20% dropout rate benchmark, which may pose serious methodological issues and attrition bias (Marcellus, 2004; Nam & Toneatto, 2016). Dropout from psychotherapy has been found to be the highest in post-secondary settings, with an average of 30% dropout. An additional potential retention challenge included over 65% (n=30) of participants participating in the intervention for research credit (not specifically treatment seeking). Of the 15 participants who did not complete the intervention for credit, only two participants dropped out, a 86.67% retention rate for the treatment-seeking participants. Although there was some attrition from the intervention, the retention rates and findings of efficacy support the feasibility of this five-week bMBI for post-secondary EAs experiencing depressive and anxious symptoms.

### **Moderating factors for intervention efficacy**

Contrary to expectations, pre-intervention perceived stress did not moderate anxious, depressive or wellbeing symptom (primary outcomes) scores at mid-intervention, post-intervention, or one-month follow-up. One possibility for the lack of moderation effects observed may be the overall elevated and limited variability of stress scores for the current sample of bMBI participants. The current study indicates that perceived stress does not moderate mood, anxiety or wellbeing outcomes from bMBI in a sample of emerging adults with elevated stress;

however, it cannot clarify the role of perceived stress in moderating mental health symptoms in low and medium stress groups. Although pre-intervention stress was not found to moderate the treatment efficaciousness of this bMBI, correlational analyses indicated that pre-intervention perceived stress was positively correlated with levels of depressive and anxious, and negatively correlated with well-being across all timepoints.

In addition, low self-compassion scores did not moderate significant mental health outcome improvements, contrary to expectations. Instead, high self-compassion scores at pre-intervention were predictive of significant reductions in anxious and depressive symptoms and improvements in mental wellbeing. In line with emerging theory that exercising self-compassion when faced with negative affect and cognitions is adaptive – a key skill learned in MBCT – it is possible that individuals with higher initial compassion scores were better equipped to adaptively sit with their negative experiences in the intervention, reducing psychological distress and improving wellbeing (Kuyken et al., 2010).

No significant reductions in suppression or increases in reappraisal were found during the intervention. Contrary to the current findings, suppression and reappraisal have been positively and negatively associated with anxiety and depression, respectively (Aldao et al., 2010). In addition, previous brief acceptance- and mindfulness-based treatments have led to improvements in emotion regulation difficulties illustrating enhanced emotion regulation (Gratz & Tull, 2010). It is possible that the brevity and structure of the current intervention did not facilitate the acquisition of emotion regulation skills in line with the theory that mindfulness is a special type of cognitive reappraisal that precedes emotion regulation (Chambers et al., 2009; Roemer et al., 2015). In the current intervention the first week focused on introducing the ideas of present moment awareness and automaticity, concepts that are relatively simple, but rarely practiced in

the busy world of post-secondary students. In week two, participants were introduced to concepts related to emotion regulation, such as reactivity vs. responsiveness, non-judgmental reframing, and psychopathology. The finding of a large clinical increase in reappraisal at one-month follow-up suggests that the acquisition of emotion regulation skills requires time to first cultivate mindfulness (e.g., present moment awareness, responsiveness) before skills can be enhanced. Reduction in reappraisal and maintenance of suppression at mid-intervention (beginning of week three) may illustrate participants beginning to learn that not everything is a problem that needs to (or can be) solved in the moment, and the cultivation of these acceptance based approaches. With this line of thinking and with continued cultivation of mindfulness, acceptance and acquisition of ER skills, it would be expected that ER skills would continue to improve, and suppression decrease.

## Chapter 5: Limitations

The major methodological limitation of this study is the absence of a comparison group, limiting the ability to infer causation of participants' improvements through the bMBI. For example, it is possible that depressive or anxious symptoms could have been elevated prior to program participation due to the period of the school year, returning naturally to a lower level when school pressures decreased. I attempted to mitigate this limitation by obtaining baseline assessment and one month follow-up assessments, controlling for variations in the waiting period. Nonetheless, the results reported here must be considered preliminary and as hypothesis generating, particularly since this is the first intervention study for this brief form of MBI for university students.

The self-compassion moderation finding should be interpreted with caution. While it is true that higher baseline self-compassion scores were predictive of mental wellbeing outcomes in this sample of emerging adult students, self-compassion may also mediate this relationship. Based on recent research into mindfulness-based interventions for depression, MBCT effects on depressive symptoms were mediated by the ability to cultivate self-compassion across the time of the intervention and continuing until 15 months following the intervention (Kuyken et al., 2010). The current study is unable to conduct a mediation analysis, due to a lack of power to detect meditation effects, as mediation analyses require a minimum sample of ~107 for adequate power (Fritz & MacKinnon, 2007).

The timing of the baseline assessment and follow-up assessment could also have impacted the improvement observed in pre- follow-up scores, since over half of the participants completed follow-up measures after completion of their academic year (beginning of the academic summer). I tested this possibility by controlling for the time of the follow-up

assessments (end of March compared to beginning of May) and found no significant association between improved scores and time of follow-up completion. In line with previous research, treatment dosage variability (between 3 to 5 sessions attended) did not have a significant effect on the outcomes (Creswell, 2017).

Nonspecific factors (e.g., expectancy, the therapeutic alliance, self-selection bias, competency of mindfulness leader) cannot be controlled in a single-group design. These factors may have played an important role in the positive intervention results. Even if the beneficial effects were associated with the intervention alone, the specific aspects of the bMBI that were most important (e.g., mindfulness meditation, home-practice, acceptance approaches, social support, group processes) will have to await further “dismantling” studies of bMBIs. The current study questionnaire did not inquire about whether participants were currently taking prescription medications or utilizing additional mental health services (e.g., psychologist, group psychotherapy) – and therefore we were unable to exclude or control for these factors. The most useful aspects of the intervention likely vary, depending within-person variability (e.g., needs, personality).

Another methodological limitation is conducting multiple statistical comparisons for the outcomes. The number of analyses conducted increases the likelihood of Type I error. Given that this was a preliminary, hypothesis-generating study with a small sample, I did not correct for the number of analyses and have a less conservative assessment of efficacy, consistent with other preliminary studies. There is also the danger of Type II error, as the current study had a relatively small sample. For example, it may be that the expected ER effects were present but not identified in this study due to insufficient power. The lack of power and large number of analyses in the current study, warrant interpretation of the results with these limitations in mind. Nevertheless,

the robust findings of the current study were all expected results that were strong clinically and statistically, after controlling for a number of health behaviour covariates.



## **Chapter 6: Directions for Future Research**

The current study provides preliminary evidence that this five-session bMBI allowed emerging adults to cultivate self-compassion during the intervention and maintain it through to one month follow-up. The study also provides direction for future research investigating bMBI. Studies with a longer follow-up period, larger sample size, and randomized control groups will provide validity to the current findings. It is important to continue investigating the relationships identified in this preliminary research, at three-months, six-months, and one-year post-intervention. Future research will be important to identify whether this bMBI is efficacious in promoting long-term and sustained improvements in the mental health-related outcomes investigated in the current study, as well as considering the relationship between these mental health-related outcomes and mindfulness.

Randomized control trials of bMBI treatment groups and other control or comparison intervention conditions will provide a better understanding of the unique improvements experienced by emerging adults enrolled bMBI. A larger sample and comparison groups would also allow for further analysis of which individuals benefit most from bMBI and for whom the intervention is not sufficient, allowing for improved and refined screening processes. Home practice should be more actively recorded and considered as a predictor of intervention efficacy. Finally, future investigations should be adequately powered to investigate the mediating role of self-compassion and perceived stress to better understand mechanisms of change in this mindfulness intervention.

## **Chapter 7: Conclusions**

In summary, the current study suggests that providing brief mindfulness-based interventions aimed at the university undergraduate population is a useful addition to university counselling services. Preliminary findings indicate that this five-week mindfulness course adapted for university students experiencing sub-clinical mood and/or anxious symptoms is a feasible and efficacious element of a wider student mental health strategy. This study is one of the few baseline controlled studies on such therapeutic interventions within emerging adult research and fills a gap in knowledge in the field of emerging adulthood and mindfulness intervention research. Since public health continues to favour interventions that promote mental health and wellbeing in educational institutions (Mental Health Foundation, 2016), further research should also consider whether these findings have wider application. Students in post-secondary education often experience distress that can cascade into serious mental health problems. bMBI is a relatively short and inexpensive preventive intervention that shows promise in reducing students' mental health symptoms and increasing their sense of wellbeing.

### Bibliography

- Aberson, C. L., Healy, M., & Romero, V. (2000). Ingroup bias and self-esteem: A meta-analysis. *Personality and Social Psychology Review, 4*(2), 157–173.  
[https://doi.org/10.1207/S15327957PSPR0402\\_04](https://doi.org/10.1207/S15327957PSPR0402_04)
- Adewuya, A. O., Ola, B. A., & Afolabi, O. O. (2006). Validity of the patient health questionnaire (PHQ-9) as a screening tool for depression amongst Nigerian university students. *Journal of Affective Disorders, 96*(1–2), 89–93. <https://doi.org/10.1016/j.jad.2006.05.021>
- Aldao, A., Nolen-Hoeksema, S., & Schweizer, S. (2010). Emotion-regulation strategies across psychopathology: A meta-analytic review. *Clinical Psychology Review, 30*(2), 217–237.  
<https://doi.org/10.1016/j.cpr.2009.11.004>
- Antaramian, S. P., Scott Huebner, E., Hills, K. J., & Valois, R. F. (2010). A dual-factor model of mental health: Toward a more comprehensive understanding of youth functioning. *American Journal of Orthopsychiatry, 80*(4), 462–472. <https://doi.org/10.1111/j.1939-0025.2010.01049.x>
- Anticich, S. A., Barrett, P. M., Silverman, W., Lacherez, P., & Gillies, R. (2013). The prevention of childhood anxiety and promotion of resilience among preschool-aged children: A universal school based trial. *Advances in School Mental Health Promotion*.  
<https://doi.org/10.1080/1754730X.2013.784616>
- Arnett, J. J., Žukauskiene, R., & Sugimura, K. (2014). The new life stage of emerging adulthood at ages 18-29 years: Implications for mental health. *The Lancet Psychiatry, 1*(7), 569–576.  
[https://doi.org/10.1016/S2215-0366\(14\)00080-7](https://doi.org/10.1016/S2215-0366(14)00080-7)
- Balzarotti, S., John, O. P., & Gross, J. J. (2010). An Italian adaptation of the emotion regulation questionnaire. *European Journal of Psychological Assessment, 26*(1), 61–67.

<https://doi.org/10.1027/1015-5759/a000009>

- Bargh, J. A., & Chartrand, T. L. (1999). The unbearable automaticity of being. *American Psychologist*, *54*(7), 462. <https://doi.org/10.1037/0003-066X.54.7.462>
- Bargh, J. A., & Williams, L. E. (2007). The Nonconscious Regulation of Emotion. *Handbook of Emotion Regulation*, *1*, 429–445.
- Barlow, D. H., Ellard, K. K., Sauer-Zavala, S., Bullis, J. R., & Carl, J. R. (2014). The Origins of Neuroticism. *Perspectives on Psychological Science*, *9*(5), 481–496.  
<https://doi.org/10.1177/1745691614544528>
- Barry, A. E., Chaney, B. H., Stelfox, M. L., & Dodd, V. (2015). Evaluating the psychometric properties of the AUDIT-C among college students. *Journal of Substance Use*, *20*(1), 1–5.  
<https://doi.org/10.3109/14659891.2013.856479>
- Bass, M., Dawkin, M., Muncer, S., Vigurs, S., & Bostock, J. (2016). Validation of Warwick-Edinburgh Mental Well-being Scale (WEMWBS) in a population of people using Secondary Care Mental Health Services. *Journal of Mental Health (Abingdon, England)*, *25*(4), 323–329. <https://doi.org/10.3109/09638237.2015.1124401>
- Baum, A., Singer, J. E., & Baum, C. S. (1981). Stress and the Environment. *Journal of Social Issues*, *37*(1), 4–35. <https://doi.org/10.1111/j.1540-4560.1981.tb01056.x>
- Baumeister, R. F., Smart, L., & Boden, J. M. (1996). Relation of Threatened Egotism to Violence and Aggression: The Dark Side of High Self-Esteem. *Psychological Review*, *103*(1), 5. <https://doi.org/10.1037/0033-295X.103.1.5>
- Beck, A. T. (1987). Cognitive models of depression. *Journal of Cognitive Psychotherapy*, *14*(1), 29–61.
- Bergin, A. J., & Pakenham, K. I. (2016). The Stress-Buffering Role of Mindfulness in the

- Relationship Between Perceived Stress and Psychological Adjustment. *Mindfulness*, 7(4), 928–939. <https://doi.org/10.1007/s12671-016-0532-x>
- Birnie, K., Speca, M., & Carlson, L. E. (2010). Exploring self-compassion and empathy in the context of mindfulness-based stress reduction (MBSR). *Stress and Health*. <https://doi.org/10.1002/smi.1305>
- Bishop, S. R., Lau, M., Shapiro, S., Carlson, L., Anderson, N. D., Carmody, J., ... Devins, G. (2004). Mindfulness: A proposed operational definition. *Clinical Psychology: Science and Practice*, 11(3), 230–241. <https://doi.org/10.1093/clipsy/bph077>
- Bluth, K., & Blanton, P. W. (2014). Mindfulness and Self-Compassion: Exploring Pathways to Adolescent Emotional Well-Being. *Journal of Child and Family Studies*. <https://doi.org/10.1007/s10826-013-9830-2>
- Boschloo, L., Nolen, W. A., Spijker, A. T., Hoencamp, E., Kupka, R., Penninx, B. W. J. H., & Schoevers, R. A. (2013). The Mood Disorder Questionnaire (MDQ) for detecting (hypo)manic episodes: Its validity and impact of recall bias. *Journal of Affective Disorders*, 151(1), 203–208. <https://doi.org/10.1016/j.jad.2013.05.078>
- Brown, K. W., Weinstein, N., & Creswell, J. D. (2012). Trait mindfulness modulates neuroendocrine and affective responses to social evaluative threat. *Psychoneuroendocrinology*, 37(12), 2037–2041. <https://doi.org/10.1016/j.psyneuen.2012.04.003>
- Campbell-Sills, L., & Barlow, D. H. (2007). Incorporating emotion regulation into conceptualizations and treatments of anxiety and mood disorders. In *Handbook of emotion regulation*. (pp. 542–559). New York; NY; US: Guilford Press. [https://doi.org/10.1016/0022-4596\(78\)90152-4](https://doi.org/10.1016/0022-4596(78)90152-4)

- Cape, J., Whittington, C., Buszewicz, M., Wallace, P., & Underwood, L. (2010). Brief psychological therapies for anxiety and depression in primary care: Meta-analysis and meta-regression. *BMC Medicine*. <https://doi.org/10.1186/1741-7015-8-38>
- Carlson, L. E., Speca, M., Faris, P., & Patel, K. D. (2007). One year pre-post intervention follow-up of psychological, immune, endocrine and blood pressure outcomes of mindfulness-based stress reduction (MBSR) in breast and prostate cancer outpatients. *Brain, Behavior, and Immunity*. <https://doi.org/10.1016/j.bbi.2007.04.002>
- Carmody, J., & Baer, R. A. (2008). Relationships between mindfulness practice and levels of mindfulness, medical and psychological symptoms and well-being in a mindfulness-based stress reduction program. *Journal of Behavioral Medicine*. <https://doi.org/10.1007/s10865-007-9130-7>
- Carmody, J., & Baer, R. A. (2009). How long does a mindfulness-based stress reduction program need to be? A review of class contact hours and effect sizes for psychological distress. *Journal of Clinical Psychology*, *65*(6), 627–638. <https://doi.org/10.1002/jclp.20555>
- Chambers, R., Gullone, E., & Allen, N. B. (2009). Mindful emotion regulation: An integrative review. *Clinical Psychology Review*. <https://doi.org/10.1016/j.cpr.2009.06.005>
- Chang, V. Y., Palesh, O., Caldwell, R., Glasgow, N., Abramson, M., Luskin, F., ... Koopman, C. (2004). The effects of a mindfulness-based stress reduction program on stress, mindfulness self-efficacy, and positive states of mind. *Stress and Health*, *20*(3), 141–147. <https://doi.org/10.1002/smi.1011>
- Chen, F., Curran, P. J., Bollen, K. A., Kirby, J., & Paxton, P. (2008). An empirical evaluation of the use of fixed cutoff points in RMSEA test statistic in structural equation models. *Sociological Methods and Research*. <https://doi.org/10.1177/0049124108314720>

- Chen, Y., Yang, X., Wang, L., & Zhang, X. (2013). A randomized controlled trial of the effects of brief mindfulness meditation on anxiety symptoms and systolic blood pressure in Chinese nursing students. *Nurse Education Today*, *33*(10), 1166–1172.  
<https://doi.org/10.1016/j.nedt.2012.11.014>
- Chiesa, A., Calati, R., & Serretti, A. (2011). Does mindfulness training improve cognitive abilities? A systematic review of neuropsychological findings. *Clinical Psychology Review*, *31*(3), 449–464. <https://doi.org/10.1016/j.cpr.2010.11.003>
- Chiesa, A., & Serretti, A. (2009). Mindfulness-Based Stress Reduction for Stress Management in Healthy People: A Review and Meta-Analysis. *The Journal of Alternative and Complementary Medicine*. <https://doi.org/10.1089/acm.2008.0495>
- Clarke, A., Friede, T., Putz, R., Ashdown, J., Martin, S., Blake, A., ... Stewart-Brown, S. (2011). Warwick-Edinburgh Mental Well-being Scale (WEMWBS): Validated for teenage school students in England and Scotland. A mixed methods assessment. *BMC Public Health*, *11*(1), 487. <https://doi.org/10.1186/1471-2458-11-487>
- Cobb, S. (1976). Social support as a moderator of life stress. *Psychosomatic Medicine*, *38*(5), 300–314. <https://doi.org/10.1097/00006842-197609000-00003>
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Erlbaum.
- Cohen, S. (1994). Perceived stress scale. *Psychology*. <https://doi.org/10.1037/t02889-000>
- Cohen, S., Janicki-Deverts, D., & Miller, G. E. (2007). Psychological stress and disease. *JAMA : The Journal of the American Medical Association*, *298*(14), 1685–1687.  
<https://doi.org/10.1001/jama.298.14.1685>
- Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A Global Measure of Perceived Stress.

- Journal of Health and Social Behavior*. <https://doi.org/10.2307/2136404>
- Cohen, S., & Janicki-Deverts, D. (2012). Who's Stressed? Distributions of Psychological Stress in the United States in Probability Samples from 1983, 2006, and 2009. *Journal of Applied Social Psychology*. <https://doi.org/10.1111/j.1559-1816.2012.00900.x>
- Cohen, S., & Wills, T. A. (1985). Stress, Social Support, and the Buffering Hypothesis. *Psychological Bulletin*, 98(2), 310. <https://doi.org/10.1037/0033-2909.98.2.310>
- Colodro-Conde, L., Couvy-Duchesne, B., Zhu, G., Coventry, W. L., Byrne, E. M., Gordon, S., ... Martin, N. G. (2017). A direct test of the diathesis–stress model for depression. *Molecular Psychiatry*, 23(7), 1590–1596. <https://doi.org/10.1038/mp.2017.130>
- Creswell, J. D. (2017). Mindfulness Interventions. *Annual Review of Psychology*, 68, 491–516. <https://doi.org/10.1146/annurev-psych-042716-051139>
- Creswell, J. D., & Lindsay, E. K. (2014). How Does Mindfulness Training Affect Health? A Mindfulness Stress Buffering Account. *Current Directions in Psychological Science*, 23(6), 401–407. <https://doi.org/10.1177/0963721414547415>
- Curran, P. J., Obeidat, K., & Losardo, D. (2010a). Twelve frequently asked questions about growth curve modeling. *Journal of Cognition and Development*. <https://doi.org/10.1080/15248371003699969>
- Curran, P. J., Obeidat, K., & Losardo, D. (2010b). Twelve frequently asked questions about growth curve modeling. *Journal of Cognitive Development*, 11(2), 121–136. <https://doi.org/10.1080/15248371003699969>. Twelve
- Davis, M., & Vander Stoep, A. (1997). The transition to adulthood for youth who have serious emotional disturbance: developmental transition and young adult outcomes. *Journal of Mental Health Administration*, 24(4), 400–427. <https://doi.org/10.1007/BF02790503>



- De Girolamo, G., Dagani, J., Purcell, R., Cocchi, A., & McGorry, P. D. (2012). Age of onset of mental disorders and use of mental health services: Needs, opportunities and obstacles. *Epidemiology and Psychiatric Sciences*, *21*(1), 47–57.  
<https://doi.org/10.1017/S2045796011000746>
- Desrosiers, A., Vine, V., Klemanski, D. H., & Nolen-Hoeksema, S. (2013). Mindfulness and emotion regulation in depression and anxiety: Common and distinct mechanisms of action. *Depression and Anxiety*, *165*, 31–37. <https://doi.org/10.1002/da.22124>
- Diener, E., Oishi, S., & Lucas, R. E. (2012). Subjective Well-Being: The Science of Happiness and Life Satisfaction. In *The Oxford Handbook of Positive Psychology*, (2 Ed.) (pp. 187–194). New York, NY, US: Oxford University Press.  
<https://doi.org/10.1093/oxfordhb/9780195187243.013.0017>
- Disch, W. B., Harlow, L. L., Campbell, J. F., & Dougan, T. R. (2000). Student functioning, concerns, and socio-personal well-being. *Social Indicators Research*, *51*(1), 41–74.  
<https://doi.org/10.1023/A:1007013820439>
- Fergusson, D. M., Horwood, L. J., Ridder, E. M., & Beautrais, A. L. (2005). Subthreshold depression in adolescence and mental health outcomes in adulthood. *Archives of General Psychiatry*, *62*(1), 66–72. <https://doi.org/10.1001/archpsyc.62.1.66>
- Ferro, M. A., Gortler, J. W., & Boyle, M. H. (2015). Trajectories of depressive symptoms during the transition to young adulthood: The role of chronic illness. *Journal of Affective Disorders*, *174*, 594–601. <https://doi.org/10.1016/j.jad.2014.12.014>
- Field, A. (2013). *Discovering statistics using IBM SPSS statistics*. *Statistics*.
- Foland-Ross, L. C., & Gotlib, I. H. (2012). Cognitive and neural aspects of information processing in major depressive disorder: An integrative perspective. *Frontiers in*

- Psychology*, 3, 489. <https://doi.org/10.3389/fpsyg.2012.00489>
- Fortney, L., Luchterhand, C., Zakletskaia, L., Zgierska, A., & Rakel, D. (2013). Abbreviated mindfulness intervention for job satisfaction, quality of life, and compassion in primary care clinicians: A pilot study. *Annals of Family Medicine*. <https://doi.org/10.1370/afm.1511>
- Fritz, M. S., & MacKinnon, D. P. (2007). Required sample size to detect the mediated effect. *Psychological Science*. <https://doi.org/10.1111/j.1467-9280.2007.01882.x>
- Galante, J., Dufour, G., Vainre, M., Wagner, A. P., Stochl, J., Benton, A., ... Jones, P. B. (2018). A mindfulness-based intervention to increase resilience to stress in university students (the Mindful Student Study): a pragmatic randomised controlled trial. *The Lancet Public Health*. [https://doi.org/10.1016/S2468-2667\(17\)30231-1](https://doi.org/10.1016/S2468-2667(17)30231-1)
- Garber, J., & Hollon, S. D. (1980). Universal versus personal helplessness in depression: Belief in uncontrollability or incompetence? *Journal of Abnormal Psychology*, 89(1), 56–66. <https://doi.org/10.1037/0021-843X.89.1.56>
- Garland, E. L., Gaylord, S. A., & Fredrickson, B. L. (2011). Positive Reappraisal Mediates the Stress-Reductive Effects of Mindfulness: An Upward Spiral Process. *Mindfulness*, 2(1), 59–67. <https://doi.org/10.1007/s12671-011-0043-8>
- Gotlib, I. H., & Joormann, J. (2010). Cognition and Depression: Current Status and Future Directions. *Annu. Rev. Clin. Psychol*, 6, 285–312. <https://doi.org/10.1146/annurev.clinpsy.121208.131305>
- Grant, N., Hotopf, M., Breen, G., Cleare, A., Grey, N., Hepgul, N., ... Tylee, A. (2014). Predicting outcome following psychological therapy in IAPT (PROMPT): A naturalistic project protocol. *BMC Psychiatry*. <https://doi.org/10.1186/1471-244X-14-170>
- Gratz, K. L., & Tull, M. T. (2010). *Emotion regulation as a mechanism of change in acceptance-*

- and mindfulness-based treatments. Assessing mindfulness and acceptance processes in clients: Illuminating the theory and practice of change.* <https://doi.org/10.1037/a0022144>
- Greenspoon, P. J., & Saklofske, D. H. (2001). Toward an integration of subjective well-being and psychopathology. *Social Indicators Research*, *54*(1), 81–108.  
<https://doi.org/10.1023/A:1007219227883>
- Griffith, J. W., Zinbarg, R. E., Craske, M. G., Mineka, S., Rose, R. D., Waters, A. M., & Sutton, J. M. (2010). Neuroticism as a common dimension in the internalizing disorders. *Psychological Medicine*, *40*(7), 1125–1136. <https://doi.org/10.1017/S0033291709991449>
- Gross, J. J., & Jazaieri, H. (2014). Emotion, emotion regulation, and psychopathology: an affective science perspective. *Clinical Psychological Science*, *2*(4), 387–401.  
<https://doi.org/10.1177/2167702614536164>
- Gross, J. J., & John, O. P. (2003). Individual Differences in Two Emotion Regulation Processes: Implications for Affect, Relationships, and Well-Being. *Journal of Personality and Social Psychology*, *85*(2), 348. <https://doi.org/10.1037/0022-3514.85.2.348>
- Gross, J., & Munoz, R. (1995). Emotion regulation and mental health. *Clinical Psychology Science and Practice*, *2*(2), 151–164. <https://doi.org/papers://B9ADBC58-3831-4D93-BEE7-6A784A58423D/Paper/p1167>
- Grossman, P., Niemann, L., Schmidt, S., & Walach, H. (2004). Mindfulness-based stress reduction and health benefits: A meta-analysis. *Journal of Psychosomatic Research*, *57*(1), 35–43. [https://doi.org/10.1016/S0022-3999\(03\)00573-7](https://doi.org/10.1016/S0022-3999(03)00573-7)
- Hammen, C. (2005). Stress and depression. *Annu Rev Clin Psychol*, *1*, 293–319.  
<https://doi.org/10.1146/annurev.clinpsy.1.102803.143938>
- Harter, S. (1999). *The construction of the self: a developmental perspective.* *Integrative*

*processes and socialization Early to middle childhood.*

- Hayes, J. A., Lockard, A. J., Janis, R. A., & Locke, B. D. (2016). Construct validity of the Self-Compassion Scale-Short Form among psychotherapy clients. *Counselling Psychology Quarterly*, 29(4), 405–422. <https://doi.org/10.1080/09515070.2016.1138397>
- Hayes, S. C. (2004). Acceptance and commitment therapy, relational frame theory, and the third wave of behavioral and cognitive therapies. *Behavior Therapy*, 35(4), 639–665. [https://doi.org/10.1016/S0005-7894\(04\)80013-3](https://doi.org/10.1016/S0005-7894(04)80013-3)
- Hayes, S. C., Luoma, J. B., Bond, F. W., Masuda, A., & Lillis, J. (2006). Acceptance and Commitment Therapy: Model, processes and outcomes. *Behaviour Research and Therapy*, 44(1), 1–25. <https://doi.org/10.1016/j.brat.2005.06.006>
- Hayes, S. C., & Wilson, K. G. (2003). Mindfulness: Method and process. *Clinical Psychology: Science and Practice*, 10(2), 161–165. <https://doi.org/10.1093/clipsy/bpg018>
- Hetrick, S. E., Parker, A. G., Hickie, I. B., Purcell, R., Yung, A. R., & McGorry, P. D. (2008). Early identification and intervention in depressive disorders: Towards a clinical staging model. *Psychotherapy and Psychosomatics*, 77(5), 263–270. <https://doi.org/10.1159/000140085>
- Hill, C. L. M., & Updegraff, J. A. (2012). Mindfulness and its relationship to emotional regulation. *Emotion*, 12(1), 81. <https://doi.org/10.1037/a0026355>
- Hofmann, S. G., & Asmundson, G. J. G. (2008). Acceptance and mindfulness-based therapy: New wave or old hat? *Clinical Psychology Review*, 28(1), 1–16. <https://doi.org/10.1016/j.cpr.2007.09.003>
- Hofmann, S. G., Sawyer, A. T., Witt, A. A., & Oh, D. (2010). The Effect of Mindfulness-Based Therapy on Anxiety and Depression: A Meta-Analytic Review. *Journal of Consulting and*

*Clinical Psychology*, 78(2), 169. <https://doi.org/10.1037/a0018555>

Hölzel, B. K., Lazar, S. W., Gard, T., Schuman-Olivier, Z., Vago, D. R., & Ott, U. (2011). How does mindfulness meditation work? Proposing mechanisms of action from a conceptual and neural perspective. *Perspectives on Psychological Science*, 6(6), 537–559.

<https://doi.org/10.1177/1745691611419671>

Huebner, E. S. (2004). Research on Assessment of Life Satisfaction of Children and Adolescents. *Social Indicators Research*, 66(1–2), 3–33.

<https://doi.org/10.1023/B:SOCI.0000007497.57754.e3>

Huffziger, S., & Kuehner, C. (2009). Rumination, distraction, and mindful self-focus in depressed patients. *Behaviour Research and Therapy*, 47(3), 224–230.

<https://doi.org/10.1016/j.brat.2008.12.005>

Hunsley, J., Elliott, K., & Therrien, Z. (2013). W1: The Efficacy and Effectiveness of Psychological Treatments. *Canadian Psychological Association*.

<https://doi.org/10.1037/a0036933>

Huttenlocher, J., Haight, W., Bryk, A., Seltzer, M., & Lyons, T. (1991). Early Vocabulary Growth: Relation to Language Input and Gender. *Developmental Psychology*, 27(2), 236.

<https://doi.org/10.1037/0012-1649.27.2.236>

Ising, H. K., Veling, W., Loewy, R. L., Rietveld, M. W., Rietdijk, J., Dragt, S., ... Van Der Gaag, M. (2012). The validity of the 16-item version of the prodromal questionnaire (PQ-16) to screen for ultra high risk of developing psychosis in the general help-seeking population. *Schizophrenia Bulletin*, 38(6), 1288–1296.

<https://doi.org/10.1093/schbul/sbs068>

Jacobson, N. S., & Truax, P. (1991). Clinical Significance: A Statistical Approach to Defining

- Meaningful Change in Psychotherapy Research. *Journal of Consulting and Clinical Psychology*. <https://doi.org/10.1037/0022-006X.59.1.12>
- Jahoda, M. (1958). *Current concepts of positive mental health*. American Anthropologist. New York, NY, US: Basic Books. <https://doi.org/10.1037/11258-000>
- Jones, P. B. (2013). Adult mental health disorders and their age at onset. *The British Journal of Psychiatry. Supplement*, 202(54), 5–10. <https://doi.org/10.1192/bjp.bp.112.119164>
- Kabat-Zinn, J. (1982). An outpatient program in behavioral medicine for chronic pain patients based on the practice of mindfulness meditation: Theoretical considerations and preliminary results. *General Hospital Psychiatry*, 4(1), 33–47. [https://doi.org/10.1016/0163-8343\(82\)90026-3](https://doi.org/10.1016/0163-8343(82)90026-3)
- Kabat-Zinn, J. (1990). *Full catastrophe living: The program of the Stress Reduction Clinic at the University of Massachusetts Medical Center*. *The Nurse Practitioner*. <https://doi.org/10.1097/00006205-199202000-00020>
- Kabat-Zinn, J. (2003). Mindfulness-based interventions in context: Past, present, and future. *Clinical Psychology: Science and Practice*, 10(2), 144–156. <https://doi.org/10.1093/clipsy/bpg016>
- Kelly, A. C., Vimalakanthan, K., & Carter, J. C. (2014). Understanding the roles of self-esteem, self-compassion, and fear of self-compassion in eating disorder pathology: An examination of female students and eating disorder patients. *Eating Behaviors*, 15(3), 388–391. <https://doi.org/10.1016/j.eatbeh.2014.04.008>
- Kessler, R. C., Berglund, P., Demler, O., Jin, R., Merikangas, K. R., & Walters, E. E. (2005). Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the National Comorbidity Survey Replication. *Archives of General Psychiatry*, 62(6), 593–602.

<https://doi.org/62/6/593> [pii]r10.1001/archpsyc.62.6.593

- Keum, B. T., Miller, M. J., & Inkelas, K. K. (2018). Testing the factor structure and measurement invariance of the PHQ-9 across racially diverse U.S. college Students. *Psychological Assessment, 30*(8), 1096–1106. <https://doi.org/10.1037/pas0000550>
- Khoury, B., Lecomte, T., Fortin, G., Masse, M., Therien, P., Bouchard, V., ... Hofmann, S. G. (2013). Mindfulness-based therapy: A comprehensive meta-analysis. *Clinical Psychology Review, 33*(6), 763–771. <https://doi.org/10.1016/j.cpr.2013.05.005>
- Kroenke, K., Spitzer, R. L., & Williams, J. B. W. (2001). The PHQ-9: Validity of a brief depression severity measure. *Journal of General Internal Medicine, 16*(9), 606–613. <https://doi.org/10.1046/j.1525-1497.2001.016009606.x>
- Kroenke, K., Spitzer, R. L., Williams, J. B. W., & Löwe, B. (2010). The Patient Health Questionnaire Somatic, Anxiety, and Depressive Symptom Scales: A systematic review. *General Hospital Psychiatry, 32*(4), 345–359. <https://doi.org/10.1016/j.genhosppsy.2010.03.006>
- Kumar, S., Feldman, G., & Hayes, A. (2008). Changes in mindfulness and emotion regulation in an exposure-based cognitive therapy for depression. *Cognitive Therapy and Research, 32*(6), 734. <https://doi.org/10.1007/s10608-008-9190-1>
- Kuyken, W., Watkins, E., Holden, E., White, K., Taylor, R. S., Byford, S., ... Dalgleish, T. (2010). How does mindfulness-based cognitive therapy work? *Behaviour Research and Therapy, 48*(11), 1105–1112. <https://doi.org/10.1016/j.brat.2010.08.003>
- Lahey, B. B. (2009). Public Health Significance of Neuroticism. *American Psychologist, 64*(4), 441. <https://doi.org/10.1037/a0015309>
- Lancaster, S. L., Klein, K. P., & Knightly, W. (2016). Mindfulness and Relaxation: a

- Comparison of Brief, Laboratory-Based Interventions. *Mindfulness*, 7(3), 614–621.  
<https://doi.org/10.1007/s12671-016-0496-x>
- Langer, E. J. (1989). *Mindfulness*. Reading, MA, US: Addison-Wesley/Addison Wesley Longman.
- Lazarus, R. S. (1974). Psychological Stress and Coping in Adaptation and Illness. *The International Journal of Psychiatry in Medicine*, 5(4), 321–333.  
<https://doi.org/10.2190/T43T-84P3-QDUR-7RTP>
- Lazarus, R. S., & Launier, R. (1978). Stress-Related Transactions between Person and Environment. In *Perspectives in Interactional Psychology*. [https://doi.org/10.1007/978-1-4613-3997-7\\_12](https://doi.org/10.1007/978-1-4613-3997-7_12)
- Lee, E. H. (2012). Review of the psychometric evidence of the perceived stress scale. *Asian Nursing Research*, 6(4), 121–127. <https://doi.org/10.1016/j.anr.2012.08.004>
- Lindsay, E. K., & Creswell, J. D. (2017). Mechanisms of mindfulness training: Monitor and Acceptance Theory (MAT). *Clinical Psychology Review*, 51, 48–59.  
<https://doi.org/10.1016/j.cpr.2016.10.011>
- Locke, B. D., Bieschke, K. J., Castonguay, L. G., & Hayes, J. A. (2012). The center for collegiate mental health: Studying college student mental health through an innovative research infrastructure that brings science and practice together. *Harvard Review of Psychiatry*, 20(4), 233–245. <https://doi.org/10.3109/10673229.2012.712837>
- Lopez, A. D., Mathers, C. D., Ezzati, M., Jamison, D. T., & Murray, C. J. L. (2006). Global and regional burden of disease and risk factors, 2001: systematic analysis of population health data. *Lancet (London, England)*, 367(9524), 1747–1757. [https://doi.org/10.1016/S0140-6736\(06\)68770-9](https://doi.org/10.1016/S0140-6736(06)68770-9)



- Löwe, B., Decker, O., Müller, S., Brähler, E., Schellberg, D., Herzog, W., & Herzberg, P. Y. (2008). Validation and standardization of the generalized anxiety disorder screener (GAD-7) in the general population. *Medical Care, 46*(3), 266–74. <https://doi.org/10.1097/MLR.0b013e318160d093>
- Luo, L. (1994). University Transition: Major and Minor Life Stressors, Personality Characteristics and Mental Health. *Psychological Medicine, 24*(1), 81–87. <https://doi.org/10.1017/S0033291700026854>
- MacBeth, A., & Gumley, A. (2012). Exploring compassion: A meta-analysis of the association between self-compassion and psychopathology. *Clinical Psychology Review, 32*(6), 545–552. <https://doi.org/10.1016/j.cpr.2012.06.003>
- Manea, L., Gilbody, S., & McMillan, D. (2012). Optimal cut-off score for diagnosing depression with the Patient Health Questionnaire (PHQ-9): A meta-analysis. *CMAJ, 84*(3), E191–E196. <https://doi.org/10.1503/cmaj.110829>
- Manea, L., Gilbody, S., & McMillan, D. (2015). A diagnostic meta-analysis of the Patient Health Questionnaire-9 (PHQ-9) algorithm scoring method as a screen for depression. *General Hospital Psychiatry, 37*(1), 67–75. <https://doi.org/10.1016/j.genhosppsych.2014.09.009>
- Marcellus, L. (2004). Are we missing anything? Pursuing research on attrition. *Canadian Journal of Nursing Research*.
- Mazure, C. M. (1998). Life stressors as risk factors in depression. *Clinical Psychology: Science and Practice, 5*(3), 291–313. <https://doi.org/10.1111/j.1468-2850.1998.tb00151.x>
- McGorry, P., Bates, T., & Birchwood, M. (2013). Designing youth mental health services for the 21st century: Examples from Australia, Ireland and the UK. *British Journal of Psychiatry, 202*(54), 30–35. <https://doi.org/10.1192/bjp.bp.112.119214>

- McGorry, P. D., Purcell, R., Goldstone, S., & Amminger, G. P. (2011). Age of onset and timing of treatment for mental and substance use disorders: Implications for preventive intervention strategies and models of care. *Current Opinion in Psychiatry*, *24*(4), 301–306. <https://doi.org/10.1097/YCO.0b013e3283477a09>
- McKnight, P. E., McKnight, K. M., Sidani, S., & Figueredo, A. J. (2007). *Methodology in the social sciences. Missing data: A gentle introduction*. New York, NY, US: Guilford Press.
- McMillan, D., Gilbody, S., & Richards, D. (2010). Defining successful treatment outcome in depression using the PHQ-9: A comparison of methods. *Journal of Affective Disorders*, *127*(1–3), 122–129. <https://doi.org/10.1016/j.jad.2010.04.030>
- Melka, S. E., Lancaster, S. L., Bryant, A. R., & Rodriguez, B. F. (2011). Confirmatory factor and measurement invariance analyses of the emotion regulation questionnaire. *Journal of Clinical Psychology*, *67*(12), 1283–1293. <https://doi.org/10.1002/jclp.20836>
- Mental Health Foundation. (2016). *Fundamental Facts About Mental Health 2016*. Mental Health Foundation: London.
- Mermelstein, L. C., & Garske, J. P. (2015). A Brief Mindfulness Intervention for College Student Binge Drinkers: A Pilot Study. *Psychology of Addictive Behaviors*, *29*(2), 259. <https://doi.org/10.1037/adb0000040>
- Monroe, S. M., & Simons, A. D. (1991). Diathesis-stress theories in the context of life stress research: implications for the depressive disorders. *Psychological Bulletin*, *110*(3), 406. <https://doi.org/10.1037/0033-2909.110.3.406>
- Monshat, K., Khong, B., Hased, C., Vella-Brodrick, D., Norrish, J., Burns, J., & Herrman, H. (2013). “A conscious control over life and my emotions:” Mindfulness practice and healthy young people. A qualitative study. *Journal of Adolescent Health*, *52*(5), 572–577.

<https://doi.org/10.1016/j.jadohealth.2012.09.008>

Morrison, R., & O'Connor, R. C. (2005). Predicting psychological distress in college students:

The role of rumination and stress. *Journal of Clinical Psychology, 61*(4), 447–460.

<https://doi.org/10.1002/jclp.20021>

Muthén, B. O., & Curran, P. J. (1997). General Longitudinal Modeling of Individual Differences in Experimental Designs: A Latent Variable Framework for Analysis and Power Estimation.

*Psychological Methods, 2*(4), 371. <https://doi.org/10.1037/1082-989X.2.4.371>

Nam, S., & Toneatto, T. (2016). The Influence of Attrition in Evaluating the Efficacy and

Effectiveness of Mindfulness-Based Interventions. *International Journal of Mental Health and Addiction. https://doi.org/10.1007/s11469-016-9667-1*

Neff, K. (2003). Self-Compassion: An Alternative Conceptualization of a Healthy Attitude

Toward Oneself. *Self and Identity, 2*(2), 85–101. <https://doi.org/10.1080/15298860309032>

Neff, K. D. (2008). Self-Compassion: Moving Beyond the Pitfalls of a Separate Self-Concept.

*Transcending Self-Interest: Psychological Explorations of the Quiet Ego, 41*(1), 139–154.

<https://doi.org/10.1037/11771-009>

Neff, K. D. (2009). Self-Compassion. In M. R. Leary & R. H. Hoyle (Eds.), *Handbook of*

*Individual Differences in Social Behavior* (pp. 561-573). New York: Guilford Press.

Neff, K. D., Kirkpatrick, K. L., & Rude, S. S. (2007). Self-compassion and adaptive

psychological functioning. *Journal of Research in Personality.*

<https://doi.org/10.1016/j.jrp.2006.03.004>

Neff, K. D., & Vonk, R. (2009). Self-compassion versus global self-esteem: Two different ways of relating to oneself. *Journal of Personality, 77*(1), 23–50. [https://doi.org/10.1111/j.1467-](https://doi.org/10.1111/j.1467-6494.2008.00537.x)

[6494.2008.00537.x](https://doi.org/10.1111/j.1467-6494.2008.00537.x)

NHS. (2018). *Psychological Therapies, Annual Report on the use of IAPT Services*. NHS Digital.

Nieuwsma, J. A., Trivedi, R. B., McDuffie, J., Kronish, I., Benjamin, D., Williams, J. W., & Jr.

(2012). Brief psychotherapy for depression: a systematic review and meta-analysis.

*International Journal of Psychiatry in Medicine*, 43(2), 129–151.

<https://doi.org/10.2190/PM.43.2.c>

Nolen-Hoeksema, S. (2000). The role of rumination in depressive disorders and mixed

anxiety/depressive symptoms. *Journal of Abnormal Psychology*, 109(3), 504.

<https://doi.org/10.1037/0021-843X.109.3.504>

Nolen-Hoeksema, S., & Morrow, J. (1991). A prospective study of depression and posttraumatic

stress symptoms after a natural disaster: the 1989 Loma Prieta Earthquake. *Journal of*

*Personality and Social Psychology*, 61(1), 115. <https://doi.org/10.1037/0022-3514.61.1.115>

Nunnally, J., & Bernstein, I. (1994). *Psychometric Theory*, 3rd edn, 1994. McGraw-Hill, New York.

Nyklíček, I., Dijkman, S. C., Lenders, P. J., Fonteijn, W. A., & Koolen, J. J. (2014). A brief mindfulness based intervention for increase in emotional well-being and quality of life in percutaneous coronary intervention (PCI) patients: The MindfulHeart randomized controlled trial. *Journal of Behavioral Medicine*, 37(1), 135–144.

<https://doi.org/10.1007/s10865-012-9475-4>

Nyklíček, I., Mommersteeg, P. M. C., Van Beugen, S., Ramakers, C., & Van Boxtel, G. J.

(2013). Mindfulness-based stress reduction and physiological activity during acute stress: A randomized controlled trial. *Health Psychology : Official Journal of the Division of Health Psychology, American Psychological Association*, 32(10), 1110.

<https://doi.org/10.1037/a0032200>

- Ontario College Health Association. (2009). *Towards a comprehensive mental health strategy: The crucial role of colleges and universities as partners.*
- Patel, Flisher, & Hetrick & McGorry. (2007). Mental health of young people: a global public-health challenge. *Lancet*, 369(9569), 1302–1313. [https://doi.org/10.1016/S0140-6736\(07\)60368-7](https://doi.org/10.1016/S0140-6736(07)60368-7)
- Pettit, J. W., Roberts, R. E., Lewinsohn, P. M., Seeley, J. R., & Yaroslavsky, I. (2011). Developmental Relations Between Perceived Social Support and Depressive Symptoms Through Emerging Adulthood: Blood Is Thicker Than Water. *Journal of Family Psychology*, 25(1), 127. <https://doi.org/10.1037/a0022320>
- Pickert, K. (2014). The Mindful Revolution. *Time Magazine.*
- Piet, J., & Hougaard, E. (2011). The effect of mindfulness-based cognitive therapy for prevention of relapse in recurrent major depressive disorder: A systematic review and meta-analysis. *Clinical Psychology Review*, 31(6), 1032–1040. <https://doi.org/10.1016/j.cpr.2011.05.002>
- Raes, F., Pommier, E., Neff, K. D., & Van Gucht, D. (2011). Construction and factorial validation of a short form of the Self-Compassion Scale. *Clinical Psychology and Psychotherapy*, 18(3), 250–255. <https://doi.org/10.1002/cpp.702>
- Regehr, C., Glancy, D., & Pitts, A. (2013). Interventions to reduce stress in university students: A review and meta-analysis. *Journal of Affective Disorders.* <https://doi.org/10.1016/j.jad.2012.11.026>
- Reinherz, H. Z., Paradis, A. D., Giaconia, R. M., Stashwick, C. K., & Fitzmaurice, G. (2003). Childhood and adolescent predictors of major depression in the transition to adulthood. *American Journal of Psychiatry*, 160(12), 2141–2147.

<https://doi.org/10.1176/appi.ajp.160.12.2141>

Robins, C. J., & Block, P. (1988). Personal Vulnerability, Life Events, and Depressive Symptoms: A Test of a Specific Interactional Model. *Journal of Personality and Social Psychology*, 54(5), 847. <https://doi.org/10.1037/0022-3514.54.5.847>

Roemer, L., Williston, S. K., & Rollins, L. G. (2015). Mindfulness and emotion regulation. *Current Opinion in Psychology*, 3, 52–57.

<https://doi.org/https://doi.org/10.1016/j.copsyc.2015.02.006>

Roeser, R. W., & Eccles, J. S. (2015). Mindfulness and compassion in human development: Introduction to the special section. *Developmental Psychology*, 51(1), 1.

<https://doi.org/10.1037/a0038453>

Rosen, G. (1959). Social Stress and Mental Disease from the Eighteenth Century to the Present: Some Origins of Social Psychiatry. *The Milbank Memorial Fund Quarterly*, 37(1), 5–32.

<https://doi.org/10.2307/3348745>

Rosenthal, R., & Fode, K. L. (1963). The effect of experimenter bias on the performance of the albino rat. *Behavioral Science*, 8(3), 183–189. <https://doi.org/10.1002/bs.3830080302>

Ross, S. E., Niebling, B. C., & Heckert, T. M. (1999). Sources of Stress Among College Students. *College Student Journal*, 61(5), 841–846. <https://doi.org/Article>

Rottenberg, J., & Gross, J. J. (2003). When emotion goes wrong: Realizing the promise of affective science. *Clinical Psychology: Science and Practice*, 10(2), 227–232.

<https://doi.org/10.1093/clipsy/bpg012>

Roulston, A., Montgomery, L., Campbell, A., & Davidson, G. (2018). Exploring the impact of mindfulness on mental wellbeing, stress and resilience of undergraduate social work students. *Social Work Education*. <https://doi.org/10.1080/02615479.2017.1388776>

- Rubin, J. B. (1999). Close encounters of a new kind: Toward an integration of psychoanalysis and buddhism. *American Journal of Psychoanalysis*, 59(1), 5–24.  
<https://doi.org/10.1023/A:1021436704327>
- Schumer, M. C., Lindsay, E. K., & David Creswell, J. (2018). Brief mindfulness training for negative affectivity: A systematic review and meta-analysis. *Journal of Consulting and Clinical Psychology*, 86(7), 569. <https://doi.org/10.1037/ccp0000324>
- Selchen S., & Diplock, B.D. (2019). Ultra-Brief Intervention to Reduce Depressive and Anxious Symptoms. Manuscript in preparation.
- Seligman, M. E., & Csikszentmihalyi, M. (2000). Positive psychology: An introduction. *American Psychologist*, 55(1), 5. <https://doi.org/10.1037/0003-066X.55.1.5>
- Seligman, M. E., Steen, T. A., Park, N., & Peterson, C. (2005). Positive psychology progress: empirical validation of interventions. *The American Psychologist*.  
<https://doi.org/10.1037/0003-066X.60.5.410>
- Sells, S. B. (1970). On the nature of stress. In J. E. McGrath (Ed.). *Social and psychological factors in stress* (pp 134 - 139). New York: Holt, Rinehart & Winston.
- Shearer, A., Hunt, M., Chowdhury, M., & Nicol, L. (2015). Effects of a Brief Mindfulness Meditation Intervention on Student Stress and Heart Rate Variability. *International Journal of Stress Management*, 23(2), 232. <https://doi.org/10.1037/a0039814>
- Singer, A. R., & Dobson, K. S. (2007). An experimental investigation of the cognitive vulnerability to depression. *Behaviour Research and Therapy*, 45(3), 563–575.  
<https://doi.org/10.1016/j.brat.2006.05.007>
- Smith, B. W., Shelley, B. M., Dalen, J., Wiggins, K., Tooley, E., & Bernard, J. (2008). A pilot study comparing the effects of mindfulness-based and cognitive-behavioral stress reduction.

- Journal of Alternative and Complementary Medicine (New York, N.Y.)*, 14(3), 251–258.  
<https://doi.org/10.1089/acm.2007.0641>
- Song, Y., & Lindquist, R. (2015). Effects of mindfulness-based stress reduction on depression, anxiety, stress and mindfulness in Korean nursing students. *Nurse Education Today*, 35(1), 86–90. <https://doi.org/10.1016/j.nedt.2014.06.010>
- Spitzer, R. L., Kroenke, K., Williams, J. B. W., & Löwe, B. (2006). A Brief Measure for Assessing Generalized Anxiety Disorder. *Archives of Internal Medicine*, 166(10), 1092–1097. <https://doi.org/10.1001/archinte.166.10.1092>
- Sukhera, J., Fisman, S., & Davidson, S. (2015). Mind the gap: a review of mental health service delivery for transition age youth. *Vulnerable Children and Youth Studies*, 10(4), 271–280. <https://doi.org/10.1080/17450128.2015.1080393>
- Sukhera, J., Lynch, J., Wardrop, N., & Miller, K. (2017). Real-Time Needs, Real-Time Care: Creating Adaptive Systems of Community-Based Care for Emerging Adults. *Canadian Journal of Community Mental Health*, 36(1), 41–53. <https://doi.org/10.7870/cjcmh-2017-003>
- Suldo, S. M., & Shaffer, E. J. (2008). Looking Beyond Psychopathology: The Dual-Factor Model of Mental Health in Youth. *School Psychology Review*, 37(1).
- Swift, J. K., & Greenberg, R. P. (2014). A Treatment by disorder meta-analysis of dropout from Psychotherapy. *Journal of Psychotherapy Integration*. <https://doi.org/10.1037/a0037512>
- Tang, Y. Y., Hölzel, B. K., & Posner, M. I. (2015). The neuroscience of mindfulness meditation. *Nature Reviews Neuroscience*, 16(4), 213. <https://doi.org/10.1038/nrn3916>
- Tennant, R., Hiller, L., Fishwick, R., Platt, S., Joseph, S., Weich, S., ... Stewart-Brown, S. (2007). The Warwick-Edinburgh Mental Well-being Scale (WEMWBS): development and



UK validation. *Health and Quality of Life Outcomes*, 5(1), 63. <https://doi.org/10.1186/1477-7525-5-63>

Toneatto, T., & Nguyen, L. (2007). Does mindfulness meditation improve anxiety and mood symptoms? A review of the controlled research. *Canadian Journal of Psychiatry*.  
<https://doi.org/10.1177/070674370705200409>

Van Dam, N. T., Sheppard, S. C., Forsyth, J. P., & Earleywine, M. (2011). Self-compassion is a better predictor than mindfulness of symptom severity and quality of life in mixed anxiety and depression. *Journal of Anxiety Disorders*, 25(1), 123–130.  
<https://doi.org/10.1016/j.janxdis.2010.08.011>

van Praag, H. M., de Kloet, E. R., & van Os, J. (2004). Stress, the brain and depression. New York, NY, US: Cambridge University Press.

Wang, P. S., Berglund, P., & Kessler, R. C. (2000). Recent care of common mental disorders in the United States : prevalence and conformance with evidence-based recommendations. *Journal of General Internal Medicine*, 15(5), 284–292. <https://doi.org/10.1046/j.1525-1497.2000.9908044.x>

Westerhof, G. J., & Keyes, C. L. M. (2010). Mental illness and mental health: The two continua model across the lifespan. *Journal of Adult Development*, 17(2), 110–119.  
<https://doi.org/10.1007/s10804-009-9082-y>

Whelton, W. J. (2004). Emotional processes in psychotherapy: Evidence across therapeutic modalities. *Clinical Psychology and Psychotherapy*, 11(1), 58–71.  
<https://doi.org/10.1002/cpp.392>

Wills, T. A., Cohen, S., & Syme, S. L. (1985). Supportive functions of interpersonal relationships. In *Social Support and Health* (pp. 61–82). San Diego, CA, US: Academic

Press.

- Wills, T. A., & Langner, T. S. (1980). Socioeconomic status and stress . In I. L. Kutash & L. B. Schlesinger (Eds.), *Handbook on stress and anxiety* (p 159 - 173). San Francisco: Josey-Bass.
- Winnebeck, E., Fissler, M., Gärtner, M., Chadwick, P., & Barnhofer, T. (2017). Brief training in mindfulness meditation reduces symptoms in patients with a chronic or recurrent lifetime history of depression: A randomized controlled study. *Behaviour Research and Therapy*, 99(Supplement C), 124–130. <https://doi.org/https://doi.org/10.1016/j.brat.2017.10.005>
- World Health Organisation (WHO). (1946). Constitution of the World Health Organization. *Basic Documents*. <https://doi.org/10.2105/AJPH.36.11.1315>
- Yudko, E., Lozhkina, O., & Fouts, A. (2007). A comprehensive review of the psychometric properties of the Drug Abuse Screening Test. *Journal of Substance Abuse Treatment*, 32(2), 189–198. <https://doi.org/10.1016/j.jsat.2006.08.002>
- Zeidan, F., Johnson, S. K., Gordon, N. S., & Goolkasian, P. (2010). Effects of Brief and Sham Mindfulness Meditation on Mood and Cardiovascular Variables. *The Journal of Alternative and Complementary Medicine*, 16(8), 867–873. <https://doi.org/10.1089/acm.2009.0321>

## Appendices

### Appendix A: Variability in Time Between Baseline and Pre-Measure

*Linear Mixed Effects Model of the Effects of Time (Baseline to pre-treatment) on Anxious Symptoms, Depressive Symptom, Mental Wellbeing, Self-Compassion Perceived Stress, Reappraisal, and Suppression*

Outcomes	Time 1 (Baseline)		Time 2 (Pre-MBI)		<i>B</i>	$\beta$	<i>SE</i> ( $\beta$ )	<i>p</i>	95% CI for $\beta$	<i>d</i>
	Mean	<i>SD</i>	Mean	<i>SD</i>						
Anxious Symptoms	13.11	4.72	12.2	4.38	0.15	0.01	0.25	0.95	-0.49, 0.52	0.20
Depressive Symptoms	14.39	5.38	12.99	5.19	-2.21	-0.21	0.25	0.40	-0.70, 0.29	0.26
Mental Wellbeing	35.14	7.91	38.50	7.20	-8.07	-0.53	0.28	0.07	-1.10, 0.05	0.44
Self-Compassion	31.24	8.33	31.02	7.91	-0.53	-0.03	0.21	0.88	-0.46, 0.39	0.03
Perceived Stress	25.43	5.20	25.16	3.52	-0.61	0.07	0.30	0.82	-0.67, 0.53	0.07
Reappraisal	26.86	7.55	26.76	4.50	-6.49	-0.52	0.32	0.12	-1.18, 0.13	0.02
Suppression	16.38	6.41	15.42	5.02	-3.69	-0.32	0.23	0.17	-0.79, 0.14	0.17

*ES* = (Mean time 2 - Mean time 1) / Pooled *SD*

## Appendix B: HPRC Informed Consent Form / On-line Consent Script

### Informed Consent Form – MINIMAL RISK

**Date:** November 16, 2018

**Study Name:** A 5-week Mindfulness Program for Emerging Adults Experiencing Anxious and/or Depressive Symptoms

**Researchers:**

*Dr. Jennine Rawana, Ph.D., C.Psych.*  
*Associate Professor, Clinical Psychologist*

*Ben Diplock, MA Candidate*  
*Clinical Developmental Psychology, York University*

**Purpose of the Research:** The purpose of the study is to investigate the effects of a mindfulness-program on the mental health and wellbeing of undergraduate students with elevated depressive and anxious symptoms.

**What You Will Be Asked to Do in the Research:** All participants that complete this initial <30 minute questionnaire and meet study inclusion criteria, will be invited to participate in the program and complete four additional short questionnaires related to the mindfulness program. The program involves participating in a total of 5 weekly, 90-minute mindfulness sessions, with weekly home practice. If you agree to partake in the study, you will be required to complete a questionnaire before the program begins, at the start of the first session of the program, at the programs mid-point, immediately following program completion, and one month after the program completion. Participants who complete the questionnaires and program will be eligible for a 1-of-3 \$75 gift card draw or an added percentage to your PSYC 1010 grade. Participants are eligible for the gift card draw or course credits even if they withdraw from the study.

**Risks and Discomforts:** There could be some mild discomfort or distress in answering some of the questionnaires, and/or some discomfort associated with becoming more aware of personal distress through the meditative and reflective processes of the intervention. Since the intervention takes place in a group setting, there is the potential for some embarrassment if participants display or disclose more of their personal distress or feelings than they would normally feel comfortable to do amongst others. Though, this is not a feature of the intervention itself and could happen in any gathering; the intervention does not compel disclosure or event vocal participation, and participants are reminded about being guided by their personal comfort on this issue. This is not over and beyond what would be expected in a standard group and is likely to be of lower risk because of the lower expectations of vocal participation in the study protocol. At study enrollment, participants are informed that they may withdraw from the study at any time.

**Benefits of the Research and Benefits to You:** Research considering Mindfulness-based programs supports the role of mindfulness practices in improving a wide range of mental health and wellbeing outcomes, including depressive / anxious symptoms, and stress. Mindfulness-based programs have been supported as a realistic treatment for people experiencing depressive and anxious symptoms, given that their efficacy has been repeatedly demonstrated. Benefits also include contributing to research that may improve symptoms and general outcomes for students. You may or may not benefit directly from participating in this study. We hope that the information from this study will help expand mental health service options for other university students.

**Voluntary Participation:** Your participation in the study is completely voluntary and you may choose to stop participating at any time. Your decision not to volunteer will not influence the nature of your relationship with the researchers, York University either now, or at any point in the future.

**Withdrawal from the Study:** You can stop participating in the study at any time, for any reason, if you so decide. Your decision to stop participating will not affect your relationship with the researchers, York University, or any other group associated with this project. In the event you withdraw from the study, all associated data collected will be discarded. If you decide to stop participating, you will no longer be eligible to participate in the 1-in-3 \$75 gift card draw, but will be eligible for PSYC 1010 credit, if you completed one or more questionnaires.

**Confidentiality:** All responses to these questions will be kept anonymous and confidential by the researchers. Data will be stored online on a secured website and will be transferred to Dr. Jennine Rawana's secure research server. Data files will be password protected. Data will be stored electronically for seven years, at which point the data will be destroyed. Data files without identifying information may be kept indefinitely at York University. Confidentiality will be provided to the fullest extent possible by law. Your name will not be linked with your answers.

**Questions About the Research?** If you have questions about the research in general or about your role in the study, please feel free to contact Jennine Rawana either by telephone, or by e-mail. This research has received ethics review and approval by the Human Participants Review Sub-Committee, York University's Ethics Review Board and conforms to the standards of the Canadian Tri-Council Research Ethics guidelines. If you have any questions about this process, or about your rights as a participant in the study, please contact the Sr. Manager & Policy Advisor for the Office of Research Ethics, York University.

**List of Mental Health & Support Services / Resources:** Some of the questions in this survey may have made you feel uncomfortable or distressed. If you or anyone you know is feeling depressed or psychologically distressed, there is help available. Below is contact information for some helpful services if you are feeling psychologically depressed or distressed.

*Counselling Services in the GTA:*

1. Toronto Psychological Services [www.toronto-ps.com](http://www.toronto-ps.com)
2. Distress Centre of Toronto
3. Help Line for All Youth
4. Good 2 Talk (for post-secondary students) <http://www.good2talk.ca/>
5. York University - Personal Counselling Services (PCS). Located in Student Accessibility Services (SAS), and can also be reached by phone or <http://pcs.info.yorku.ca/in-case-of-crisis/>
6. The Freedom from Fear Foundation in Toronto is an organization established to help people with anxiety disorders. They have a network of support groups set up throughout Ontario
7. Drug & Alcohol Registry of Treatment (DART)/Treatment info-line
8. The National Eating Disorder Information Centre has a national register of private therapists, medical programs, and information
9. Mood Disorders Association of Ontario OR call TOLL-FREE
10. A.C.C.E.S. (Accessible Community Counselling and Employment Services)
11. Family Services Association of Toronto
12. For a list of more health, social, community, and/or government community resources/services, you can access it via [www.211toronto.ca](http://www.211toronto.ca) or you can dial 2-1-1 in Toronto 24 hours a day. This phone number is free, confidential, and the trained staff is multilingual.

I have read the consent form, have understood the nature of this project and wish to participate. I am not waiving any of my legal rights by signing this form. Clicking "I consent to participate in this study" indicates my consent. Please select below that you "agree" or "disagree" to participate in this study.

Response Options:

I agree  or disagree  to participate in the questionnaire and intervention components of this study

## Appendix C: Questionnaire Battery

**Demographics Questionnaire**

1. What is your birth date? (e.g., January 1, 2006 = 01/06/2006) \_\_\_\_/\_\_\_\_/\_\_\_\_
  2. Please indicate your gender
    - Woman  Man  Other
    - Gender-Fluid, Non-Binary and/or Two-Spirit
    - Other  Prefer not to disclose
  3. Please list your preferred email address to be contacted at:  
\_\_\_\_\_
  4. What year of undergraduate studies are you in?
    - 1<sup>st</sup> year
    - 2<sup>nd</sup> year
    - 3<sup>rd</sup> year
    - 4<sup>th</sup> year
    - Other. Please specify: \_\_\_\_\_
  4. Where do you live?
    - Parents/guardians home
    - Residence
    - Off campus
    - Other (Please Specify): \_\_\_\_\_
  5. Please indicate your ethnicity (Check one)
- Please indicate your ethnicity (Check one)
- White/Caucasian
  - Black
  - Asian (e.g., China, Japan, etc)
  - Indigenous
  - Middle Eastern
  - South-Asian (e.g., India, Pakistan, etc)
  - West Indies (e.g., Trinidad and Tobago, Guyana, etc)
  - Hispanic
  - Other: \_\_\_\_\_
  - I prefer not to answer
6. Were you born in Canada? (check one)  Yes  No
    - If "No": A) How long have you lived in Canada? \_\_\_\_\_ (years)
    - B) What country were you born in? \_\_\_\_\_
  7. Is there anything else you would like to let the Research team know to better accommodate you?

---

8. My work status is

- Full-Time       Part-Time       Unemployed       Other

12. Relationship/Marital Status:

- In Committed Relationship (<3 mths)       In Committed Relationship (3 – 6 mths)  
 In Committed Relationship (6 mths –1 yr)       In Committed Relationship (>1 yr)  
 Married       Living common law       Widowed  
 Separated       Divorced       Single

13. I have completed a 5 week (or greater) Mindfulness-Based Therapy program or CBT program in the last 3 years:

- Yes       No

If Yes, please specify: \_\_\_\_\_

14. Which of these describes your income last year?

- \$0       \$1 to \$9 999  
 \$10 000 to \$24 999       \$25 000 to 49 999  
 \$50 000 to 74 999       \$75 000 to 99 999  
 \$100 000 and greater       Prefer not to answer

15. Do you have any current or past mental health diagnoses (e.g. Generalized Anxiety Disorder, Major Depressive Disorder)?

- Yes       No       Not sure       Prefer not to disclose

16. To your knowledge, have you ever experienced ...:

- |                             |                              |                             |
|-----------------------------|------------------------------|-----------------------------|
| Psychotic symptoms          | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| Manic or hypomanic symptoms | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| Alcohol or substance misuse | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| Suicide attempt             | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| Self-harm behaviour         | Yes <input type="checkbox"/> | No <input type="checkbox"/> |

**Health-related Outcomes Questionnaire**

**GAD-7**

<b>Over the <i>last 2 weeks</i>, how often have you been bothered by the following problems?</b>	<b>Not at all</b>	<b>Several Days</b>	<b>More than half the days</b>	<b>Nearly every day</b>
1. Feeling nervous, anxious or on edge	0	1	2	3
2. Not being able to stop or control worrying	0	1	2	3
3. Worrying too much about different things	0	1	2	3
4. Trouble relaxing	0	1	2	3
5. Being so restless that it is hard to sit still	0	1	2	3
6. Becoming easily annoyed or irritated	0	1	2	3
7. Feeling afraid as if something awful might happen	0	1	2	3

8. If you checked off any problems, how difficult have these problems made it for you to do your work, take care of things at home, or get along with other people?	Not difficult at all	Somewhat difficult	Very difficult	Extremely difficult
---	----------------------	--------------------	----------------	---------------------



## PHQ-9

<b>Over the past 2 weeks, how often have you been bothered by any of the following problems?</b>	<b>Not at all</b>	<b>Several Days</b>	<b>More Than Half the Days</b>	<b>Nearly Every Day</b>
1. Little interest or pleasure in doing things	0	1	2	3
2. Feeling down, depressed or hopeless	0	1	2	3
3. Trouble falling asleep, staying asleep, or sleeping too much	0	1	2	3
4. Feeling tired or having little energy	0	1	2	3
5. Poor appetite or overeating	0	1	2	3
6. Feeling bad about yourself - or that you're a failure or have let yourself or your family down	0	1	2	3
7. Trouble concentrating on things, such as reading the newspaper or watching television	0	1	2	3
8. Moving or speaking so slowly that other people could have noticed. Or, the opposite - being so fidgety or restless that you have been moving around a lot more than usual	0	1	2	3
9. Thoughts that you would be better off dead or of hurting yourself in some way	0	1	2	3

### WEMWBS

Below are some statements about feelings and thoughts.

Please tick the box that best describes your experience of each over the last 2 weeks

STATEMENTS	None of the time	Rarely	Some of the time	Often	All of the time
I've been feeling optimistic about the future	1	2	3	4	5
I've been feeling useful	1	2	3	4	5
I've been feeling relaxed	1	2	3	4	5
I've been feeling interested in other people	1	2	3	4	5
I've had energy to spare	1	2	3	4	5
I've been dealing with problems well	1	2	3	4	5
I've been thinking clearly	1	2	3	4	5
I've been feeling good about myself	1	2	3	4	5
I've been feeling close to other people	1	2	3	4	5
I've been feeling confident	1	2	3	4	5
I've been able to make up my own mind about things	1	2	3	4	5
I've been feeling loved	1	2	3	4	5
I've been interested in new things	1	2	3	4	5
I've been feeling cheerful	1	2	3	4	5

### ERQ

We would like to ask you some questions about your emotional life, in particular, how you control (that is, regulate and manage) your emotions. The questions below involve two distinct aspects of your emotional life. One is your emotional experience, or what you feel like inside. The other is your emotional expression, or how you show your emotions in the way you talk, gesture, or behave. Although some of the following questions may seem similar to one another, they differ in important ways. For each item, please answer using the following scale:

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>
<b>Strongly Disagree</b>			<b>Neutral</b>			<b>Strongly Agree</b>

1. \_\_\_\_\_ When I want to feel more positive emotion (such as joy or amusement), I change what I'm thinking about.
2. \_\_\_\_\_ I keep my emotions to myself.
3. \_\_\_\_\_ When I want to feel less negative emotion (such as sadness or anger), I change what I'm thinking about.
4. \_\_\_\_\_ When I am feeling positive emotions, I am careful not to express them.
5. \_\_\_\_\_ When I'm faced with a stressful situation, I make myself think about it in a way that helps me stay calm.
6. \_\_\_\_\_ I control my emotions by not expressing them.
7. \_\_\_\_\_ When I want to feel more positive emotion, I change the way I'm thinking about the situation.
8. \_\_\_\_\_ I control my emotions by changing the way I think about the situation I'm in.
9. \_\_\_\_\_ When I am feeling negative emotions, I make sure not to express them.
10. \_\_\_\_\_ When I want to feel less negative emotion, I change the way I'm thinking about the situation.

## PSS

The questions in this scale ask you about your feelings and thoughts **during the last month**. In each case, you will be asked to indicate 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 unexpectedly? ..... **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**

### SCS-SF: HOW I TYPICALLY ACT TOWARDS MYSELF IN DIFFICULT TIMES

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:

**Almost  
Never**

**Almost  
Always**

**1**

**2**

**3**

**4**

**5**

- \_\_\_\_\_ 1. When I fail at something important to me I become consumed by feelings of inadequacy.
- \_\_\_\_\_ 2. I try to be understanding and patient towards those aspects of my personality I don't like.
- \_\_\_\_\_ 3. When something painful happens, I try to take a balanced view of the situation.
- \_\_\_\_\_ 4. When I'm feeling down, I tend to feel like most other people are probably happier than I am.
- \_\_\_\_\_ 5. I try to see my failings as part of the human condition.
- \_\_\_\_\_ 6. When I'm going through a very hard time, I give myself the caring and tenderness I need.
- \_\_\_\_\_ 7. When something upsets me, I try to keep my emotions in balance.
- \_\_\_\_\_ 8. When I fail at something that's important to me, I tend to feel alone in my failure
- \_\_\_\_\_ 9. When I'm feeling down I tend to obsess and fixate on everything that's wrong.
- \_\_\_\_\_ 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 disapproving and judgmental about my own flaws and inadequacies.
- \_\_\_\_\_ 12. I'm intolerant and impatient towards those aspects of my personality I don't like.

## MMFQ

<b>Please rate each of the following statements with the number that best describes your own opinion of what is generally true for you.</b>	<b>Never or very rarely true</b>	<b>Rarely true</b>	<b>Sometimes true</b>	<b>Often true</b>	<b>Very often or always true</b>
When I'm walking, I deliberately notice the sensations of my body moving. (OBS1)	1	2	3	4	5
I'm good at finding words to describe my feelings. (D2)	1	2	3	4	5
I criticize myself for having irrational or inappropriate emotions. (NJ-R3)	1	2	3	4	5
I perceive my feelings and emotions without having to react to them. (NR4)	1	2	3	4	5
When I do things, my mind wanders off and I'm easily distracted. (AA-R5)	1	2	3	4	5
When I take a shower or bath, I stay alert to the sensations of water on my body. (OBS6)	1	2	3	4	5
I can easily put my beliefs, opinions, and expectations into words. (D7)	1	2	3	4	5
I don't pay attention to what I'm doing because I'm daydreaming, worrying, or otherwise distracted. (AA-R8)	1	2	3	4	5
I watch my feelings without getting lost in them. (NR9)	1	2	3	4	5
I tell myself I shouldn't be feeling the way I'm feeling. (NJ-R10)	1	2	3	4	5
I notice how foods and drinks affect my thoughts, bodily sensations, and emotions. (OBS11)	1	2	3	4	5
It's hard for me to find the words to describe what I'm thinking. (D-R12)	1	2	3	4	5
I am easily distracted. (AA-R13)	1	2	3	4	5
I believe some of my thoughts are abnormal or bad and I shouldn't think that way. (NJ-R14)	1	2	3	4	5
I pay attention to sensations, such as the wind in my hair or sun on my face. (OBS15)	1	2	3	4	5

I have trouble thinking of the right words to express how I feel about things. (D-R16)	1	2	3	4	5
I make judgments about whether my thoughts are good or bad. (NJ-R17)	1	2	3	4	5
I find it difficult to stay focused on what's happening in the present. (AAR18)	1	2	3	4	5
When I have distressing thoughts or images, I "step back" and am aware of the thought or image without getting taken over by it. (NR19)	1	2	3	4	5
I pay attention to sounds, such as clocks ticking, birds chirping, or cars passing. (OBS20)	1	2	3	4	5
In difficult situations, I can pause without immediately reacting. (NR21)	1	2	3	4	5
When I have a sensation in my body, it's difficult for me to describe it because I can't find the right words. (D-R22)	1	2	3	4	5
It seems I am "running on automatic" without much awareness of what I'm doing. (AA-R23)	1	2	3	4	5
When I have distressing thoughts or images, I feel calm soon after.	1	2	3	4	5
I tell myself that I shouldn't be thinking the way I'm thinking. (NJ-R25)	1	2	3	4	5
I notice the smells and aromas of things. (OBS26)	1	2	3	4	5
Even when I'm feeling terribly upset, I can find a way to put it into words. (D27)	1	2	3	4	5
I rush through activities without being really attentive to them. (AA-R28)	1	2	3	4	5
When I have distressing thoughts or images, I am able just to notice them without reacting. (NR29)	1	2	3	4	5
I think some of my emotions are bad or inappropriate and I shouldn't feel them. (NJ-R30)	1	2	3	4	5
I notice visual elements in art or nature, such as colors, shapes,	1	2	3	4	5

textures, or patterns of light and shadow. (OBS31)					
My natural tendency is to put my experiences into words. (D32)	1	2	3	4	5
When I have distressing thoughts or images, I just notice them and let them go. (NR33)	1	2	3	4	5
I do jobs or tasks automatically without being aware of what I'm doing. (AA-R34)	1	2	3	4	5
When I have distressing thoughts or images, I judge myself as good or bad depending what the thought or image is about (NJ-R35)	1	2	3	4	5
I pay attention to how my emotions affect my thoughts and behavior. (OBS36)	1	2	3	4	5
I can usually describe how I feel at the moment in considerable detail. (D37)	1	2	3	4	5
I find myself doing things without paying attention. (AA-R38)	1	2	3	4	5
I disapprove of myself when I have irrational ideas. (NJ-R39)	1	2	3	4	5



## Appendix D: York Colleges System & Student Accessibility Services Email Script

Dear Undergraduate Student,

The Research on Emerging Adults, Adolescents and Children (REACH) lab would like to invite you to participate in our Mindfulness Program and research study titled, “A 5-week Mindfulness Program for Emerging Adults Experiencing Anxious and/or Depressive Symptoms”.

Mindfulness involves deliberate moment-to-moment present awareness of the breath, bodily sensations, and thoughts, led by a trained facilitator. Mindfulness may improve one’s mental health and wellbeing.

This study is a randomized control trial, meaning that all participants have an equal probability of being assigned to the intervention group (that partakes in a group while filling out questionnaires), or a waitlist (that completes questionnaires first, and gets to partake in a group later). These sessions will be weekly 90-minute mindfulness sessions conducted over a ~5-week period, with four questionnaires to be completed throughout.

For more information regarding the study, and/or if you are interested in participating please go to the following link: [Qualitrix link to be inserted here](#). If you are interested in partaking in the study, please complete the questionnaire that follows, which includes demographics and health-related questions, and should take you no more than 30 minutes to complete.

Following this, a member of the REACH lab will be in contact, to let you know whether you are eligible for the study, and whether you have been randomized to the intervention, or waitlist group.

By participating in this study, research participants will be eligible for:

- a 1 of 3 chance to win a \$75 gift card, following completion of the study
- Four PSYC 1010 course credits (for those students enrolled in PSYC 1010)

If you have any further questions, please email Ben Diplock (psychology graduate student) directly.

Sincerely,

Ben Diplock

Clinical-Developmental Psychology • Department of Psychology

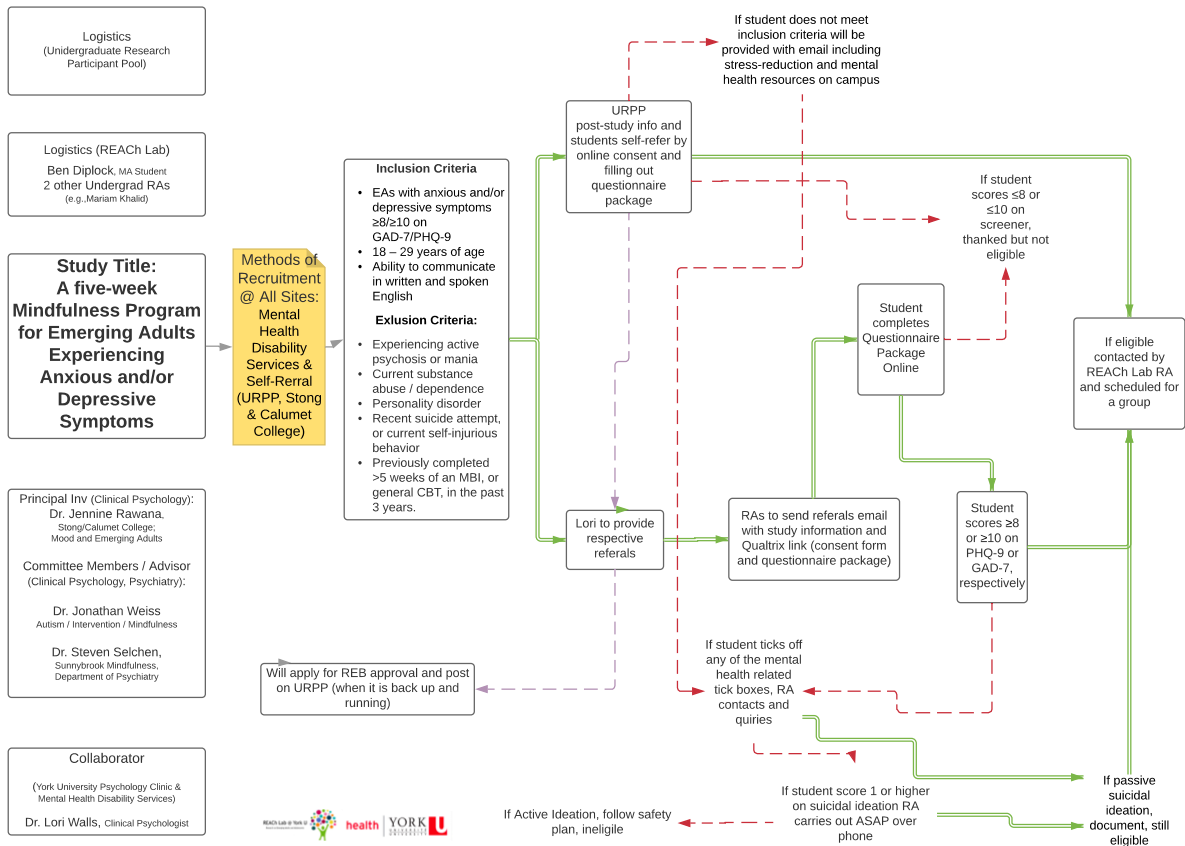
# Appendix E: Flow Chart for Study Recruitment

## FLOW CHART FOR STUDY RECRUITMENT

Rawana

Research Ethics

September 24, 2018



## Appendix F: Additional Mental Health Difficulties Screener

**AUDIT-C Questionnaire**

1. How often do you have drink containing alcohol?
  - a. Never
  - b. Monthly or less
  - c. 2 – 4 times a month
  - d. 2 – 4 times a week
  - e. 4 or more times a week
  
2. How many standard drinks containing alcohol do you have on a typical day?
  - a. 1 or 2
  - b. 3 or 4
  - c. 5 or 6
  - d. 7 to 9
  - e. 10 or more
  
3. How often do you have six or more drinks on one occasion?
  - a. Never
  - b. Less than Monthly
  - c. Monthly
  - d. Weekly
  - e. Daily or Almost Daily

## Mood Disorder Questionnaire

Please answer each questionnaire to the best of your ability.

<b>Has there ever been a period of time when you were not your usual self and...</b>		
1. ... you felt so good or so hyper that other people thought you were not your normal self, or you were so hyper that you got into trouble?	Yes	No
... you were so irritable that you shouted at people or started fights or arguments?	Yes	No
... you felt much more self-confident than usual?	Yes	No
... you got much less sleep than usual and found you didn't really miss it?	Yes	No
... you were much more talkative or spoke much faster than usual?	Yes	No
... thoughts raced through your head or you couldn't slow your mind down?	Yes	No
... you were so easily distracted by things around you that you had trouble concentrating or staying on track?	Yes	No
... you had much more energy than usual?	Yes	No
... you were much more active or did many more things than usual?	Yes	No
... you were much more social or outgoing than usual; for example, you telephoned friends in the middle of the night?	Yes	No
... you were much more interested in sex than usual?	Yes	No
... you did things that were unusual for you or that other people might have thought were excessive, foolish, or risky?	Yes	No
... spending money got you or your family into trouble?	Yes	No
<b>2. If you checked YES to more than one of the above, have several of these ever happened during the same period of time?</b>	Yes	No

- 3. How much of a problem did any of these cause you (like being unable to work; having family, money, or legal troubles; getting into arguments or fights)?**
- a. No Problem
  - b. Minor Problem
  - c. Moderate Problem
  - d. Serious Problem

### Drug Abuse Screening Test, DAST-10

The following questions concern information about your possible involvement with drugs not including alcoholic beverages during the past 12 months. "Drug abuse" refers to (1) the use of prescribed or over-the-counter drugs in excess of the directions, and (2) any nonmedical use of drugs. The various classes of drugs may include cannabis (marijuana, hashish), solvents (e.g., paint thinner), tranquilizers (e.g., Valium), barbiturates, cocaine, stimulants (e.g., speed), hallucinogens (e.g., LSD) or narcotics (e.g., heroin). Remember that the questions do not include alcoholic beverages.

Please answer every question. If you have difficulty with a statement, then choose the response that is mostly right.

In the past 12 months...		
1. Have you used drugs other than those required for medical reasons?	Yes	No
2. Do you abuse more than one drug at a time?	Yes	No
3. Are you unable to stop abusing drugs when you want to?	Yes	No
4. Have you ever had blackouts or flashbacks as a result of drug use?	Yes	No
5. Do you ever feel bad or guilty about your drug use?	Yes	No
6. Does your spouse (or parents) ever complain about your involvement with drugs?	Yes	No
7. Have you neglected your family because of your use of drugs?	Yes	No
8. Have you engaged in illegal activities in order to obtain drugs?	Yes	No
9. Have you ever experienced withdrawal symptoms (felt sick) when you stopped taking drugs?	Yes	No
10. Have you had medical problems as a result of your drug use (e.g. memory loss, hepatitis, convulsions, bleeding)?	Yes	No

### The 16-item Version of the Prodromal Questionnaire (PQ-16)

		If TRUE: how much distress did you experience?				
		None	Mild	Moderate	Severe	
1. I feel uninterested in the things I used to enjoy	True	False	0	1	2	3
2. I often seem to live through events exactly as they happened before (déjà vu).	True	False	0	1	2	3
3. I sometimes smell or taste things that other people can't smell or taste.	True	False	0	1	2	3
4. I often hear unusual sounds like banging, clicking, hissing, clapping or ringing in my ears.	True	False	0	1	2	3
5. I have been confused at times whether something I experienced was real or imaginary.	True	False	0	1	2	3
6. When I look at a person, or look at myself in a mirror, I have seen the face change right before my eyes.	True	False	0	1	2	3
7. I get extremely anxious when meeting people for the first time.	True	False	0	1	2	3
8. I have seen things that other people apparently can't see.	True	False	0	1	2	3
9. My thoughts are sometimes so strong that I can almost hear them.	True	False	0	1	2	3
10. I sometimes see special meanings in advertisements, shop windows, or in the way things are arranged around me.	True	False	0	1	2	3
11. Sometimes I have felt that I'm not in control of my own ideas or thoughts.	True	False	0	1	2	3
12. Sometimes I feel suddenly distracted by distant sounds that I am not normally aware of.	True	False	0	1	2	3
13. I have heard things other people can't hear like voices of people whispering or talking.	True	False	0	1	2	3
14. I often feel that others have it in for me.	True	False	0	1	2	3

15. I have had the sense that some person or force is around me, even though I could not see anyone.	True	False	0	1	2	3
16. I feel that parts of my body have changed in some way, or that parts of my body are working differently than before.	True	False	0	1	2	3

## Appendix G: Reliability Analysis

*Raw Cronbach  $\alpha$  for Primary and Secondary Outcomes at Time-Points*

Outcomes	Baseline	Pre- Intervention	Mid- Intervention	Post- Intervention	One- Month FU
GAD-7 (Anxious Symptoms)	0.85	0.82	0.83	0.90	0.90
PHQ-9 (Quality of Life)	0.78	0.81	0.83	0.87	0.87
WEMWBS (Mental Wellbeing)	0.89	0.88	0.90	0.93	0.94
SCS-SF (Self-Compassion)	0.84	0.85	0.82	0.85	0.83
PSS-10 (Perceived Stress)	0.72	0.63	0.59	0.80	0.87
ERQ (Reappraisal)	0.89	0.89	0.85	0.88	0.87
ERQ (Suppression)	0.87	0.73	0.81	0.84	0.90



## Appendix H: Correlation Analysis

*Pearson Correlations of Dependent Variables by Independent Covariates*

T1-T5	Age	Gender	URPP	Academic Year	Mental Health	Self Harm	Relation	Work	Session
Anxious Symptoms	0.04	0.07	-0.02	0.07	<b>0.23***</b>	0.03	-0.13	0.03	0.03
Depressive Symptoms	<b>-0.14*</b>	0.12	<b>-0.17*</b>	<b>-0.18**</b>	-0.12	0.04	-0.05	0.05	0.01
Mental Wellbeing	<b>0.25***</b>	-0.19	<b>0.31****</b>	<b>0.27***</b>	0.01	0.12	0.09	<b>-0.16*</b>	0.05
Self-Compassion	0.12	-0.03	<b>0.31****</b>	<b>0.16*</b>	0.03	0.12	0.04	-0.01	0.05
Perceived Stress	-0.13	-0.08	<b>-0.16*</b>	-0.08	-0.03	0.02	-0.04	0.02	-0.07
Reappraisal	<b>0.17*</b>	-0.01	<b>0.26***</b>	<b>0.15*</b>	<b>-0.19*</b>	0.06	0.06	-0.01	-0.14
Suppression	-0.05	<b>0.17*</b>	<b>-0.35****</b>	<b>-0.18**</b>	0.05	0.09	-0.10	-0.07	0.11

\* &lt; 0.05 \*\* &lt; 0.01 \*\*\* &lt; 0.001 \*\*\*\* &lt; 0.0001

## Appendix I: Clinical Change

*IAPT Reliable Change Index and Clinical Caseness at Timepoints*

	Outcomes	Timepoint	n of respondents (% of n)
Met clinical caseness?	Anxious Symptoms	Pre Intervention	36 (80%)
		Post-Intervention	26 (61.90%)
		One-Month Follow-Up	14 (43.75%)
	Depressive Symptoms	Pre Intervention	33 (73.33%)
		Post-Intervention	25 (59.52%)
		One-Month Follow-Up	14 (43.75%)
Reliable change?	Anxious Symptoms	Post-Intervention	13 (30.95%)
		One-Month Follow-Up	14 (43.75%)
	Depressive Symptoms	Post-Intervention	9 (21.43%)
		One-Month Follow-Up	12 (37.5%)