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Moving Beyond the Mat: Exploring the Application of Mindfulness Training in Professional and Educational Settings

Emily G. Nielsen, *The University of Western Ontario*

Supervisor: Minda, John Paul, *The University of Western Ontario*

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Abstract

Objectives. This dissertation provides an evaluation of three web-based mindfulness interventions administered to legal professionals and graduate students — populations characterized by high rates of depression, anxiety, and stress. *Chapter 2, Study 1.* Lawyers completed questionnaires before and after engaging in Cho and Gifford's (2016) 8-week Anxious Lawyer program. Analyses revealed improvements in perceived stress; mood; resilience; trait mindfulness; and the severity of depression, anxiety, and stress-related symptoms over time. *Chapter 2, Study 2.* Lawyers were randomly assigned to either an experimental or waitlist control condition. Well-being was measured at the beginning of the study (i.e., Time 1), after experimental participants had completed Cho's 30-day Mindful Pause intervention (i.e., Time 2), and after control participants had completed Mindful Pause (i.e., Time 3). Between-group analyses measured differences in Time 2 scores while controlling for variations in Time 1 scores; Time 2 and 3 comparisons were implemented to examine intervention-related changes experienced by control participants. Experimental participants reported lower Time 2 levels of perceived stress and negative affect; less severe stress-related symptoms; and higher levels of positive affect, non-reactivity, and observing than control participants, who displayed post-intervention increases in non-judging and reductions in perceived stress and negative affect. *Chapter 3.* Graduate students completed a 4-week intervention adapted from the Anxious Lawyer program. As in Chapter 2, Study 2, a mixed design was used to analyze between-group differences at Time 2 and within-group changes between Time 2 and 3. Experimental participants displayed less severe depressive symptoms at Time 2 and higher levels of trait mindfulness than control participants; comparative improvements regarding awareness, perceived stress, negative affect, and stress severity were additionally noted but were limited to those who began the study with low (awareness) or high (perceived stress, negative affect,

and stress severity) levels of these factors. Control participants experienced post-intervention decreases in perceived stress, negative affect, and the severity of stress-related symptoms, as well as increases in positive affect, non-reactivity, describing, and non-judging. *Conclusions.* These studies imply that lawyers and graduate students may benefit from the practice of mindfulness and add to a growing body of literature that suggests mindfulness enhances well-being.

Keywords

Mindfulness, Meditation, Well-Being, Wellness, Mental Health, Web-Based Intervention, Lawyers, Graduate Students

Summary for Lay Audience

Mindfulness refers to a quality of consciousness that is characterized by a purposeful and non-judgmental awareness of the present moment. A state of mindfulness can be deliberately evoked through activities like meditation, where one actively pays attention to the sensations and/or thoughts they experience while laying or sitting in silent reflection. People can be further characterized by what is referred to as trait mindfulness, which is similar to a personality trait in that it describes a natural capacity for mindfulness or how mindful someone tends to be on a regular basis. Previous research has linked both state and trait mindfulness to a number of positive outcomes, including enhanced mood and well-being. The purpose of this dissertation was to assess the effectiveness of three mindfulness-based interventions that were designed to improve the health and wellness of lawyers and graduate students — both of which are populations plagued by high rates of depression, anxiety, and stress. Interventions included an 8-week program called the Anxious Lawyer program, a 30-day program called Mindful Pause, and a 4-week program that was adapted from the Anxious Lawyer program. All three of the interventions involved online guided meditations and the Anxious Lawyer programs also included readings about mindfulness and suggestions for non-meditation-based mindfulness activities (e.g., cultivating a mindful approach to walking or eating). Participants reported decreased stress, improved mood, and increased levels of trait mindfulness following completion of each of the programs. The adapted Anxious Lawyer program was additionally linked to decreases in the severity of depression-related symptoms (e.g., negative thinking and lack of motivation) and the original Anxious Lawyer program was found to increase psychological resilience (i.e., one's ability to bounce back in difficult situations) and decrease symptoms associated with anxiety (e.g., excessive agitation). Mindfulness training, therefore, seems to have improved well-being among the participants in these studies and may be beneficial for lawyers and students who are struggling.

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List of Abbreviations

ANCOVA ..... Analysis of Covariance

ANOVA ..... Analysis of Variance

BRS ..... Brief Resilience Scale

CBT ..... Cognitive Behavioural Therapy

DASS ..... Depression Anxiety Stress Scales

FFMQ ..... Five Facet Mindfulness Questionnaire

JEQ ..... Job Effectiveness Questionnaire

LOI ..... Letter of Information

MAAS ..... Mindful Attention Awareness Scale

MBCT ..... Mindfulness-Based Cognitive Therapy

MBI ..... Mindfulness-Based Intervention

MBRP ..... Mindfulness-Based Relapse Prevention

MBSR ..... Mindfulness-Based Stress Reduction

MIT ..... Massachusetts Institute of Technology

mITT ..... Modified Intention-to-Treat

OSF ..... Open Science Framework

PANAS ..... Positive and Negative Affect Schedule

PP ..... Per-Protocol

PSS ..... Perceived Stress Scale

PTSD..... Posttraumatic Stress Disorder

REB.....Research Ethics Board

T1 ..... Time 1

T2 ..... Time 2

T3 ..... Time 3

Vs. ..... Versus

Chapter 1

1 An Introduction to Mindfulness

Mindfulness — which is an integral component of Buddhism (Snelling, 1987) — has gained significant mainstream popularity in recent years; books and instructional sources on the topic (e.g., Goleman & Davidson, 2017; Hanson & Mendius, 2009; Kabat-Zinn, 2012) are now commonplace in North American bookstores and magazines, such as *mindful*, can be readily found in the news racks lining grocery store check-outs. Widespread interest in mindfulness has been driven, in part, by research suggesting that it improves well-being and enhances cognitive processing (Chiesa et al., 2011; Chiesa & Serretti, 2009; Creswell, 2017; Keng et al., 2011; Khoury et al., 2015; Sharma & Rush, 2014) Beginning in Chapter 1 with an introduction to the concept of mindfulness, this dissertation adds to the literature in this field by presenting results from three studies outlining the effects of mindfulness on the psychological wellness of legal professionals (Chapter 2) and graduate students (Chapter 3); this is followed by a general discussion in Chapter 4.

1.1 Definitions

1.1.1 Mindfulness

The word *mindfulness* is an English translation of *sati* — a Pali term that refers to the act of remembrance (Brown et al., 2007). Definitions of mindfulness in Western literature have been varied, perhaps because *sati* is difficult to explain (Gunaratana, 2011). One of the most cited descriptions, however, comes from Kabat-Zinn (2005), who states that "[m]indfulness means paying attention in a particular way: on purpose, in the present moment, and nonjudgmentally" (p. 4). This is generally consistent with the two-part operational definition proposed by Bishop et al. (2004), which

emphasizes self-regulated attention to the present coupled with a sense of curiosity, openness, and acceptance[1] towards experience.

Though it is most often conceptualized as a psychological state achieved through deliberate action, mindfulness can additionally be viewed as a relatively stable trait that varies from person to person; these related yet discrete concepts are referred to as *state mindfulness* and *trait mindfulness*, respectively (Jamieson & Tuckey, 2017). Many scales have been developed to measure trait mindfulness, including the Five-Facet Mindfulness Questionnaire (FFMQ; Baer et al., 2006), the Freiburg Mindfulness Inventory (Walach et al., 2006), the Kentucky Inventory of Mindfulness Skills (Baer et al., 2004), the Mindful Attention Awareness Scale (MAAS; Brown & Ryan, 2003), and the Toronto Mindfulness Scale – Trait Version (Davis et al., 2009). Although there are relatively fewer of them, scales have also been designed to assess state mindfulness (e.g., the Toronto Mindfulness Scale – State Version and the State Mindfulness Scale; Lau et al., 2006 and Tanay & Bernstein, 2013, respectively). The broad distinction between these two types of measures is in how they are framed. More specifically, measures of trait mindfulness ask how representative statements are of an individual's personality and behaviour in general. Measures of state mindfulness, on the other hand, are often administered following the completion of a *mindfulness practice* — an activity or technique used to induce a state of mindfulness by promoting awareness of the present moment — and ask respondents to rate how accurately scale items describe what they experienced while engaged in the practice.

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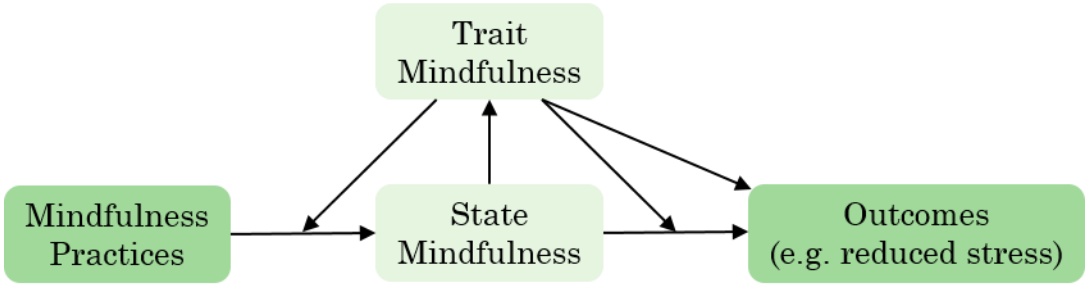
[1]It should be noted that acceptance, in this case, does not mean passive resignation; instead, it refers to an active receptivity towards the present moment that is free from appraisal and and/or attempts to alter the experience (Bishop et al., 2004).

Gunaratana (2011) advises that mindfulness is a difficult skill that, with practice, can be developed gradually over time. Mindfulness has additionally been described as a powerful tool that has the power to change one's perception of experience and can (and should) be allowed to extend beyond a practice to become a way of life (Gunaratana, 2011; Nhat Hanh, 1976; Snelling, 1987). To a certain extent, these suggestions are supported by studies indicating that engagement in a mindfulness practice may result in changes to aspects of trait mindfulness (e.g., Brown & Ryan, 2003; Klatt et al., 2009; Nadler et al., 2020; Roeser et al., 2013). Reciprocal relationships between trait and state mindfulness have also been proposed. In particular, Bamber and Kraenzle Schneider (2016) suggest that, just as trait mindfulness can be indirectly enhanced by mindfulness practices via the mindful states that they induce, trait mindfulness can influence the degree to which state mindfulness is affected by mindfulness practices and the amount of change that occurs in outcomes linked to practice-related states. This model (presented in Figure 1.1) is based, in part, on research by Shapiro and colleagues (2011) which found that, although participation in a mindfulness program led to many outcomes including increased levels of trait mindfulness, greater shifts were observed among those who reported higher levels of trait mindfulness prior to the program; this observation is consistent with work demonstrating that trait mindfulness is a significant meditator in the relationship between mindfulness practice and psychological well-being (Baer et al., 2008).

1.1.2 Meditation

The terms *meditation* and *mindfulness* are sometimes used interchangeably but they do not, in fact, refer to the same thing. Whereas mindfulness is a *quality of consciousness* that emphasizes acceptance and awareness of the present moment (Bishop et al., 2004; Kabat-Zinn, 2005), meditation is an

Figure 1.1. A model of the relationships between mindfulness practices, state and trait mindfulness, and their associated outcomes.



Note. Adapted from Bamber and Kraenzle Schneider (2016).

activity that involves the self-regulation of attention (Goleman & Schwartz, 1976) and fosters the development of concentration (Snelling, 1987).

Meditations can broadly be grouped into one of two types: *samatha*, which is Pali for *tranquility*, and *vipassanā*, meaning *insight* (Kabat-Zinn, 1982; Snelling, 1987). Both forms of meditation are practically similar in that they typically involve sitting in silence while actively paying attention to aspects of the present moment. Samatha and vipassanā differ, however, with respect to their focal targets and the attitude taken towards those targets. In particular, samatha meditation involves paying attention to a single item or sensation. Due to its ceaseless and recurrent nature, the breath is commonly used as an attentional anchor for both novices and experts alike; other targets may include feelings in the body or a mantra (i.e., a word or phrase that is repeated silently in the mind). Though relatively simple in nature, meditations of this variety can be challenging in practice as the mind is prone to wander. Samatha meditation, therefore, requires mindfulness in order to recognize and acknowledge — without judgment — when attention has strayed and to gently bring it back to the object of focus.

In contrast to the single-pointed awareness cultivated by samatha meditation, vipassanā encourages a broad awareness of anything and everything that enters the mind (Kabat-Zinn, 1982; Snelling, 1987). This may include the presence (or absence) of bodily sensations, emotions, thoughts, memories, and/or desires. Importantly, however, this awareness is to be informed by mindfulness so that each observation is viewed simply as it is — devoid from criticism, subjective labels, and value judgements. Mindfulness is additionally important for assessing when attention has waned or strayed from the present moment. When this occurs, samatha techniques can be used to ground and re-orient focus; samatha is also commonly used prior to vipassanā as a way to calm the mind and prepare for concentration.

Samatha meditation is believed to enhance concentration while vipassanā allows for the development of mindfulness by highlighting the true nature of the object(s) of focus (Snelling, 1987). Concentration and mindfulness are mutually supportive skills though, meaning that both forms of meditation can involve mindfulness to a certain extent. As a result, meditation is likely the most readily recognized mindfulness practice. Although meditation often entails a certain degree of mindfulness, however, mindfulness does not always imply traditional meditation. There are, in fact, many off-the-cushion (i.e., non-seated and/or non-meditative) mindfulness activities, such as hatha yoga, mindful walking, and mindful eating and, with extensive experience, one may find that mindfulness begins to permeate other — or perhaps all — areas of daily life.

1.2 Buddhist Beginnings

Though many spiritual and philosophical systems incorporate ideas similar to mindfulness, it is most explicitly grounded in Buddhism (Brown et al., 2007).

1.2.1 The Three Marks of Existence

Originating in India over 2500 years ago, Buddhism is a school of thought that promotes enlightenment and insight into the human condition. Ancient Buddhism — now represented by Theravada Buddhism — specifically identifies three fundamental aspects of existence: impermanence, egolessness (or non-self), and suffering. Most individuals are familiar with impermanence in the broad sense (i.e., in the sense of death, seasonal changes, etc.) but Buddhism teaches that nothing is exempt from change; thoughts, emotions, and experiences are continually emerging and disappearing in the same manner that humans are born and inevitably die. As a result, what is traditionally thought of as *the self* is nothing more than a collection of memories and the individual who experiences those memories is constantly

changing on a moment to moment basis. Egolessness, therefore, is a necessary consequence of impermanence. The lack of a stable self is, for many, an uncomfortable idea to face and one that can result in avoidance, distraction, and a search for personal identity. Buddhism suggests, however, that impermanence and egolessness render the pursuit for a sense of self futile and contributes to the suffering that one experiences throughout life (Snelling, 1987).

1.2.2 The Four Noble Truths and the Noble Eightfold Path

The existence of suffering is the first of four principles that form the fundamental basis of Buddhist doctrine (Snelling, 1987). These principles, referred to as the Four Noble Truths, are as follows:

(1) Suffering is an inevitable part of life.

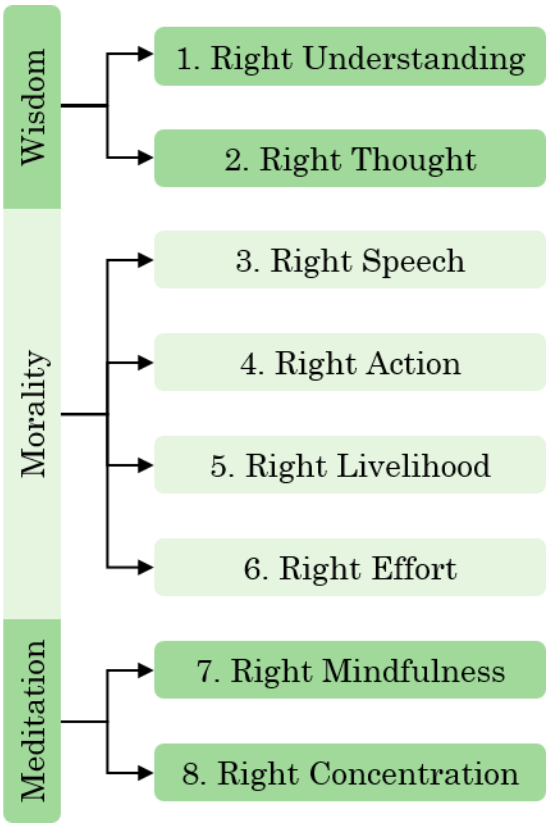
(2) Suffering is caused by craving and desire.

(3) Suffering can be eliminated and Nirvana (i.e., freedom from suffering) can be attained.

(4) The Noble Eightfold Path (displayed in Figure 1.2) provides the means for bringing suffering to an end.

In addition to right understanding, thought, speech, action, livelihood, effort, and concentration, mindfulness — which, in the Buddhist context, refers to an active and discerning awareness of internal experience (Purser & Milillo, 2015) — is identified as one of the steps of the Noble Eightfold Path. The steps are sometimes grouped together into three sub-elements: Wisdom (right understanding and thought), Morality (right speech, action, livelihood, and effort), and Meditation (right mindfulness and concentration). The activity of meditation, in turn, allows for the practice and development of mindfulness

Figure 1.2. The Noble Eightfold Path.



and concentration via a progressive awareness of bodily sensations, feelings, states of mind, and thoughts (Snelling, 1987).

Though the Path is typically presented in a hierarchical manner, it is prescribed as a whole, with each element being crucial for the proper development of the others. Attention cultivated through mindfulness, therefore, should influence and be informed by the other aspects of the Path and by the Four Noble Truths. Mindfulness also sheds light on the Three Marks of Existence by illuminating the constant fluctuation of bodily states, thoughts, emotions, and, consequently, the self. A deep understanding and awareness of impermanence and egolessness can result in many outcomes, including disidentification from emotions and thoughts, enhanced compassion due to decreased egocentricity, a greater understanding of maladaptive patterns of thought and behaviour, and reduced reactivity. In these ways, Buddhism suggests that mindfulness can aid in the reduction of suffering and allows one to experience reality directly as opposed to through a subjective lens (Snelling, 1987).

1.3 East Meets West

In the early 1950's, Zen Buddhism — a Chinese branch of Buddhism that favours practicality over (what it deems) superfluous rituals and philosophical study (Snelling, 1987) — brought mindfulness to North America (Keng et al., 2011). Though initially relegated to the fringes of Western society, mindfulness was gradually introduced to the general public via workshops and retreats and by individuals such as Thích Nhất Hạnh — a renowned Vietnamese Zen master and peace activist (J. Wilson, 2014). Throughout the following two decades, mindfulness began to catch the attention of clinicians, psychoanalysts and experimental psychologists. Initial studies on the subject focused primarily on its capacity to alter physiological arousal and expand consciousness (Keng et al., 2011). In the late 1970's,

however, work by American scientist Jon Kabat-Zinn began to shift the primary focus of mindfulness research towards health and wellness (Keng et al., 2011; J. Wilson, 2014).

1.3.1 Kabat-Zinn and the Development of Mindfulness-Based Stress Reduction

Kabat-Zinn completed a PhD in molecular biology at the Massachusetts Institute of Technology (MIT). After developing a personal interest in mindfulness following a meeting at MIT with Zen teacher Philip Kapleau, Kabat-Zinn went on to study with Thích Nhất Hạnh, Seung Sahn — a Korean Zen master whose teachings inspired the Cambridge Zen Center that Kabat-Zinn helped to found — and instructors at the Insight Meditation Society. In 1979, Kabat-Zinn founded the Stress Reduction Clinic at the University of Massachusetts Medical School. Here, by drawing on his various educational experiences, Kabat-Zinn developed what is now known as mindfulness-based stress reduction (MBSR; J. Wilson, 2014).

Originally developed as a treatment for individuals with chronic pain, MBSR was borne from the observation that meditation, when practiced extensively, can be a physically taxing activity (Kabat-Zinn, 1982). Devoted practitioners are taught to face the pain associated with extended periods of sitting by observing the sensations in a detached manner — that is, to be mindful of them. By mentally separating physical feelings of pain from the subjective interpretations and emotions that are ascribed to them, meditators often find that the pain decreases or ceases entirely (Kornfield, 1977). This approach is consistent with Melzack and Wall's (1965) gate control theory of pain, which suggests that motivational and cognitive factors can modulate the perception of pain by opening or closing the "gate" that allows pain sensations to be

transmitted through the central nervous system.[2] Hypothesizing that mindfulness could be one such motivational or cognitive factor, Kabat-Zinn (1982) reasoned that it could be an effective coping tool for those with chronic pain found to be unresponsive to more traditional forms of treatment.

MBSR was initially conceptualized as a 10-week course with weekly 2-hour group meetings and daily homework (Kabat-Zinn, 1982). Modern iterations involve the same general framework but many employ an 8-week structure with 2.5-hour weekly sessions and a day-long "retreat" (Bishop, 2002; Grossman et al., 2004). In addition to learning about the physiology of stress, MBSR participants are taught a variety of mindfulness techniques, including body sweeping, mindfulness of breath, hatha yoga, mindful walking, and mindful eating (see Figure 1.3). Initial results from a sample of 51 chronic pain patients suggested that completion of the program was associated with significant reductions in self-reported pain and the occurrence of mood disturbances and psychiatric symptoms (Kabat-Zinn, 1982). Though the reliability of this preliminary work was limited by its lack of a control condition, the results were ultimately replicated in a subsequent study of 90 chronic pain patients who demonstrated significant program-related reductions in medication usage and perceived pain, as well as improvements in body image, activity, and self-esteem; a comparison group of 21 individuals receiving standard methods of treatment (i.e., medication and/or physical therapy) showed little to no change on any of the variables considered (Kabat-Zinn et al., 1985).

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[2]Advances in pain research have since revealed that some of the original neurophysiological assumptions of gate control theory are inaccurate. The basic tenants of the theory, however, are still broadly accepted (Moayedi & Davis, 2013).

Figure 1.3. Mindfulness techniques included in Kabat-Zinn's (1982) mindfulness-based stress reduction (MBSR) program.

Body Sweeping
Progressively sweeping the attention over parts of the body from foot to head, focusing particularly on the sensations felt in each part. This technique is also referred to as body scanning.
Mindfulness of Breath
Focusing specifically on sensations associated with the breath, such as the sensation of breath entering and exiting the nostrils or the feeling of the chest rising and falling with each inhalation and exhalation.
Hatha Yoga
An activity combining physical postures and breathing techniques. In MBSR, awareness of breath and movement are emphasized as one moves in and out of the poses.
Mindful Eating
Awareness of the sensations associated with food and eating, including the appearance, smell, taste, and texture of the food; movements of the jaw and tongue; and thoughts experienced during the process.
Mindful Walking
Paying attention to the act of walking, including the motion of the body, feeling of the ground beneath the feet, and patterns of breath and thought that emerge with the movement.

1.3.2 Modern Mindfulness

Mainstream interest in mindfulness has blossomed in recent years due, in large part, to Kabat-Zinn's MBSR and the suggestion that mindfulness can measurably improve well-being. A variety of other mindfulness-based interventions (MBIs) have since been developed, including mindfulness-based cognitive therapy (MBCT; Segal et al., 2002), mindfulness-based childbirth and parenting (Duncan & Bardacke, 2010), mindfulness-based relapse prevention (MBRP; Bowen et al., 2011), mindfulness-based elder care (McBee, 2008), and mindfulness-based mind fitness training (Stanley et al., 2011). Many MBIs incorporate material that is tailored to address a specific issue or population, meaning that variability occurs across programs; in general, however, most share a similar underlying structure that combines written and/or verbal instruction with experiential mind-body learning components, such as meditation and yoga.

Despite Kabat-Zinn's background in Buddhism, MBSR, and most of the MBIs it has inspired, claim to be secular in nature (Cullen, 2011; Keng et al., 2011). Western-based mindfulness is largely devoid of Buddhist terminology, philosophy, and ethical considerations; it is not taught in the context of the Four Noble Truths or the Noble Eightfold Path and, unlike Buddhist mindfulness, it is not strictly introspective in nature.[3] Additionally, while some MBIs encourage disidentification from thoughts and feelings and an awareness of their impermanence, the three marks of existence are not specifically emphasized (Keng et al., 2011).

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[3]Introspective in this case does not mean that Buddhist mindfulness encourages ignorance of the external world; instead, it emphasizes awareness of the internal perceptions and reactions that are evoked by sensory stimuli as opposed to awareness of the stimuli themselves (Keng et al., 2011).

The attempt to distance Western mindfulness from its Buddhist roots has led to significant discussion regarding how it is applied and defined in modern contexts. Proponents of MBIs often argue that a secular approach is necessary to ensure that participants are not asked to compromise their personal beliefs and to avoid the potentially unethical introduction of religion into educational, occupational, and health-care settings (Baer & Nagy, 2017; Cullen, 2011). Mindfulness and meditation are key components of Buddhism though and many have questioned both the feasibility and propriety of extricating these concepts from their religious context.

Buddhism is inherently anti-dogmatic and in the process of gaining a greater understanding and awareness of the self — which is the fundamental goal of a Buddhist — practitioners are encouraged to accept only those teachings that are found to be personally relevant and beneficial (Snelling, 1987). This notion is emphasized by Kabat-Zinn (2005), who states that the practice of mindfulness should not inherently conflict with personal beliefs because it is not "trying to sell you anything, especially not a new belief system or ideology. It is simply a practical way to be more in touch with the fullness of your being" (p. 6). Nevertheless, concerns have been raised surrounding indoctrination and what has been termed "stealth Buddhism" (Purser, 2015). In a related manner, some believe that by obscuring the relationship between mindfulness and Buddhist culture, MBIs have compromised the process of informed consent (Gunther Brown, 2017). The Western mindfulness movement has been further accused of being colonialist (Gunther Brown, 2017), of exemplifying scientism (i.e., the belief that scientific knowledge is superior to all other forms of knowledge; Heuman, 2014), and of exploiting Buddhism for capitalist gains (Purser & Milillo, 2015; Purser & Loy, 2013). Modern conceptualizations of mindfulness have also been criticized for restricting attention to the current moment when right mindfulness in the Buddhist context prescribes an active understanding of both the past and the

present in order to identify and avoid the repetition of harmful behaviour (Purser & Milillo, 2015).

Although issues related to the ethical and respectful use of mindfulness are certainly deserving of conversation, the debate surrounding these subjects has been extensive and cannot be fully or adequately reviewed here. This dissertation does not seek to mediate or solve any of these matters; instead, it simply presents an evaluation of three MBIs that were designed to improve well-being within specific populations. It should, however, be noted that each of these programs employed a contemporary definition of mindfulness (i.e., a definition consistent with the one presented in Section 1.1.1) and focused primarily on meditation as a mindfulness technique. Each program was also secular in the sense that little to no mention was made of Buddhism or Buddhist philosophy.

1.4 General Outcomes and Explanations

MBIs have been evaluated across a variety of contexts and populations. To further isolate the effects that can be attributed to mindfulness and to test the strength of these specific effects, research has also employed brief interventions lasting 2-3 days or weeks and single-session, lab-based mindfulness inductions. Many studies have been criticized for failing to implement random allocation and for using small samples, inadequate comparison conditions, and vague operational definitions. Despite these limitations, however, the general trends within the literature are promising and seem to suggest that mindfulness has largely positive effects on health, wellness, and cognitive processing.

1.4.1 Physical Health

As discussed in Section 1.3.1, MBSR was originally developed and tested as a treatment for chronic pain (Kabat-Zinn, 1982; Kabat-Zinn et al., 1985).

Recent work has further supported the application of mindfulness as a treatment for pain by demonstrating that MBIs produce outcomes that are better than or similar to alternative forms of pain management among many different patient groups. Garland et al. (2014), for instance, found that mindfulness-oriented recovery enhancement — an 8-week MBI emphasizing mindfulness, cognitive reappraisal, and emotion regulation (Garland, 2013) — produced greater reductions in chronic pain than a social worker-led support group. Consistent with the idea that mindfulness encourages non-reactivity and a separation of sensations from subjective interpretations, pain reductions among those who participated in the MBI were found to be meditated by enhanced non-reactivity and reinterpretation of pain. The MBI also reduced participants' cravings for opioids, though this seems to have been a transitory effect as a three-month follow-up revealed no between-group differences on this measure. With respect to chronic low back pain in particular, 8-week MBIs have proven to be more effective than both educational programs (Morone et al., 2016) and treatment-as-usual (Cherkin et al., 2016) and have been found to provide relief that is similar to that obtained via cognitive behavioural therapy (CBT); advantages for MBSR and CBT over usual care appear to be maintained for up to a year (Cherkin et al., 2016) but begin to disappear by Year 2 (Cherkin et al., 2017). Work by M. C. Davis and colleagues (2015) additionally suggest a role for mindfulness in the management of pain caused by rheumatoid arthritis. More specifically, they found that an 8-week MBI designed to improve emotion regulation was more effective at reducing catastrophizing, morning disability, fatigue, and stress than both educational and pain-focused CBT programs.

The practice of mindfulness ultimately appears to hold promise as a nonpharmacological approach to pain management — something that is increasingly important to explore given the epidemic of opioid addiction and overdose that is currently sweeping North America. Mindfulness has also

been speculated to act as a buffer for physiological stress by enhancing the regulatory activity of the prefrontal cortex and decreasing the reactivity of areas responsible for the release of cortisol, epinephrine, and norepinephrine (Creswell & Lindsay, 2014). This theory is based on research demonstrating that trait mindfulness is positively related to activity in the prefrontal cortex (Creswell et al., 2007) and negatively related to both the activity in (Creswell et al., 2007; Modinos et al., 2010) and the size of (Taren et al., 2013) the amygdala.[4] Furthermore, participation in an adapted MBSR program has been found to reduce the connectivity of brain regions involved in the stress response (Taren et al., 2015). Consistent with the stress-buffering hypothesis, MBIs have been shown to reduce biological indicators of inflammation (Rosenkranz et al., 2013); assist in the cessation of stress-associated activities such as smoking (Brewer et al., 2011); and prompt improvements in symptomatology and quality of life for individuals suffering from conditions that are aggravated by stress, including psoriasis (Kabat-Zinn et al., 1998), chronic insomnia (Ong et al., 2014), irritable bowel syndrome (Gaylord et al., 2011), and HIV (Creswell et al., 2009; Gonzalez-Garcia et al., 2014; SeyedAlinaghi et al., 2012).

1.4.2 Mental Health

In addition to physiological stress, mindfulness may be an effective tool for the management of psychological stress. Two reviews — one concerning studies conducted prior to 2009 (Chiesa & Serretti, 2009) and one involving studies occurring between 2009 and 2014 (Sharma & Rush, 2014) — found that research generally supported the conclusion that MBSR was effective at

[4]Under normal conditions, the prefrontal cortex regulates thought, attention, and behaviour. In times of stress, however, regulation is compromised as the brain becomes "hijacked" by the amygdala — a structure that plays a key role in the processing of emotions and in the triggering of the fight-or-flight stress response. (Arnsten, 2009).

reducing stress among otherwise healthy individuals. Though there were many limitations to the studies considered in these reviews (e.g., lack of active comparison groups, small sample sizes, etc.), a subsequent meta-analysis conducted by Khoury et al. (2015) concluded that MBSR had a quantifiably large[5] effect on stress; moderate sized effects on depression, anxiety, distress, and quality of life; and a small effect on burnout.

The research discussed by Chiesa and Serretti (2009), Sharma and Rush (2014), and Khoury and colleagues (2015) suggests that even healthy individuals can benefit from the MBSR program. Additionally, however, MBSR has been shown to improve mental well-being across a variety of patient groups. For instance, MBSR and MBSR-derived programs have been found to reduce symptoms of depression and anxiety for individuals with autism spectrum disorder (Sizoo & Kuiper, 2017), multiple sclerosis (Grossman et al., 2010; Kolahkaj & Zargar, 2015), cancer (Speca et al., 2000), and cerebral aneurysm (Joo et al., 2010). Furthermore, participation in MBSR has been associated with improvements in posttraumatic stress disorder (PTSD; Banks et al., 2015; Polusny et al., 2015), Gulf War illness (Kearney et al., 2016), and both social and generalized anxiety disorder (Goldin & Gross, 2010; Hoge et al., 2013).

The seeming efficacy of MBSR has spurred the development of other MBIs designed to address specific mental health conditions. For example, MBRP (Bowen et al., 2011) and MBCT (Segal et al., 2002) — 8-week programs that combine aspects of MBSR and CBT — were originally designed as relapse prevention programs for substance use and depression, respectively. Both of

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[5]Khoury et al. (2015) calculated Hedges' *g* effect sizes for the studies they reviewed. Hedges' *g* is similar to Cohen's *d* in that it provides an indication of the standardized mean difference between two sets of observations and uses approximate cut-offs of .2, .5, and .8 to indicate small, medium, and large effects, respectively (Ellis, 2010).

these MBIs have been successful in producing positive outcomes. Bowen et al. (2014), for instance, found that individuals who participated in MBRP were at a significantly lower risk for relapse, substance use, and heavy drinking than participants in a standard 12-step program. A cognitive-behavioural program produced similar primary results but showed advantages over MBRP in terms of time to first drug use; MBRP, however, was associated with greater decreases in heavy drinking and days of substance use 12 months post-treatment than both the 12-step and cognitive-behavioural programs. MBCT, on the other hand, has been found to significantly reduce the risk of depression relapse for individuals with three or more prior depressive episodes (Ma & Teasdale, 2004; Piet & Hougaard, 2011; Teasdale et al., 2000). Studies assessing the effectiveness of MBCT paired with a structured withdrawal from maintenance antidepressants have suggested that MBCT is as effective at preventing relapse as medication (Kuyken et al., 2008; Segal et al., 2010), though Huijbers et al. (2016) have argued that a combined approach is more effective for maintaining long-term benefits.

Links between mindfulness and mental health are also found outside the context of structured MBIs. Trait mindfulness measured via the MAAS, for instance, has been found to correlate with several indicators of psychological well-being, including increased levels of positive affect, life satisfaction, self-esteem, optimism, vitality, self-actualization, autonomy, competence, and relatedness, in conjunction with decreased rates of negative affect, neuroticism, anxiety, hostility, depression, self-consciousness, and impulsiveness (Brown & Ryan, 2003). Similar patterns have been observed with respect to the habitual practice of mindfulness. More specifically, in a study comparing experienced meditators (M = 7.60 years of practice) with demographically similar non-meditators, meditators reported fewer psychological symptoms and issues with emotion regulation; greater self-compassion and overall well-being; and less rumination, thought suppression,

and fear of emotion than their counterparts (Lykins & Baer, 2009). Brief (8- to 15-minute) mindfulness inductions have additionally been shown to promote emotion regulation (Arch & Craske, 2006) and reduce negative affect more effectively than rumination or doing nothing among currently depressed (Huffziger & Kuehner, 2009), previously depressed (Singer & Dobson, 2007), and healthy individuals (Broderick, 2005).

1.4.3 Cognitive Processing

Cognitive-based mindfulness research has been relatively limited compared to the amount of clinical work that has been conducted (Chiesa et al., 2011). Nevertheless, studies have demonstrated links between brief (10- to 15-minute) mindfulness inductions and various aspects of cognitive processing, including improved insight problem solving ability (Ostafin & Kassman, 2012) and reductions in sunk cost (Hafenbrack et al., 2014), negativity (Kiken & Shook, 2011), and implicit age and race (Lueke & Gibson, 2014) biases. Enhanced working memory has also been observed following participation in standard MBSR (Jensen et al., 2012) and 4-week samatha-based (Zeidan et al., 2010) programs.

Given that the development of purposeful attention is one of the goals of mindfulness practice, much cognitive-related research has focused on the relationship between mindfulness and attention, with many studies suggesting that mindfulness improves performance on attention-based tasks. Mrazek and colleagues (2012), for example, found that scores on the MAAS were positively associated with performance on the Sustained Attention to Response Task — a go/no-go task that requires participants to respond to frequent non-targets and withhold responses to non-frequent targets (Robertson et al., 1997); a second study additionally demonstrated that completion of an 8-minute breathing-focused meditation resulted in fewer commission errors on this task than 8 minutes of passive relaxation or

reading. Studies employing other measures of attention, such as the d2 Test of Attention and the Attention Network Test, further suggest that selective attention and habitual responding can be improved and reduced, respectively, by participation in 5-day mind-body training programs (Tang et al., 2007), month-long mindfulness retreats (Jha et al., 2007), and 8-week MBSR courses (Jensen et al., 2012; Jha et al., 2007).

Though results from individual studies imply that mindfulness inductions and MBIs improve attentional processes, Lao et al. (2016) argue that extensive practice is likely necessary to produce measurable and sustained changes in attention and executive functioning. Consistent with this assertion, behavioural (Chan & Woollacott, 2007; Moore & Malinowski, 2009; van den Hurk et al., 2010) and neurophysiological (Brefczynski-Lewis et al., 2007) work has found a positive relationship between experience and inhibitory control. Research has also demonstrated that regular meditators (M = 9.95 h/week) display enhanced visual attention compared to non-regular meditators (M = .38 h/week; Hodgins & Adair, 2010) and that regular meditators (≥ 25 months of practice) possess greater sustained attention abilities than both non-regular meditators (< 25 months of experience) and non-meditators alike (Valentine & Sweet, 1999). Attentional blink performance of older meditators (M = 49.80 years old; 1 – 29 years of experience) has additionally been shown to be better than age-matched (M = 50.00 years old) non-meditators and similar to younger (M = 24.30 years old) non-meditators, suggesting that meditation can temper age-related declines in attentional processing (van Leeuwen et al., 2009).

1.4.4 Mechanisms of Mindfulness

The aforementioned research suggests that trait and state mindfulness are related to positive physical, psychological, and cognitive outcomes and many explanations regarding the mechanistic relationships between these factors

have been presented. Because the practice of mindfulness involves attentional redirection and focus, attention is commonly implicated as an agent of change (in addition to being a measurable cognitive outcome). For example, Bamber and Kraenzle Schneider (2016) state that paying attention can facilitate non-judgmental awareness via enhanced emotional and cognitive flexibility and that non-judgmental awareness subsequently allows for non-reactivity, emotional stability, and awareness of one's actions. Likewise, Baer and colleagues (2008) suggest that self-observation has the potential to exacerbate psychological symptoms but that mindfulness can reverse this relationship by allowing one to describe stimuli objectively, avoid judgement and reactivity, and mitigate rumination by encouraging attentional flexibility. Similar ideas have been proposed by Shapiro et al. (2006), who note that intentional attention, combined with an attitude of nonjudgmentalness, allows for disidentification from and reperception of one's personal experiences. Reperception, in turn, facilitates well-being by promoting self-regulation, the clarification of values, sustained exposure to strong or difficult emotions and thoughts, and a reduction in habitual responding via increased cognitive-behavioural flexibility. The interruption of automatic processes and the loosening of maladaptive associations have also been highlighted by accounts based in Buddhist psychology (Farb, 2019; Grabovac et al., 2011) and disidentification from negative thoughts and feelings — a concept that shares similarities with the Buddhist idea of egolessness — has been cited as one of the ways in which mindfulness enhances resilience to depression relapse (Teasdale et al., 2002).

Detailed explanations of some of the most commonly proposed mechanisms of mindfulness are presented in Figure 1.4. It is likely that mindfulness exerts its effects via a combination of some or all of these methods. Cognitive change and self-management, for instance, could work to reduce cognitive bias-based responding by facilitating awareness of internal thought processes and

Figure 1.4. Proposed mechanisms of mindfulness.

Exposure
In the absence of catastrophic consequences, sustained exposure to sensations, thoughts, and emotions leads to desensitization. This, in turn, allows for reduced emotional reactivity in response to those phenomenon. Reductions in avoidant behaviour may also occur, ultimately facilitating tolerance towards negative states.
Cognitive Change
Observation of thoughts and feelings leads to the understanding that they are subjective experiences as opposed to objective reality. Observation also allows for the identification of and redirection from maladaptive patterns of thought and behaviour, such as rumination.
Self-Management
Increased awareness of sensations, thoughts, and actions facilitates the use of adaptive coping skills by allowing one to recognize early warning signs and better understand the consequences of behaviour. Taking time to observe and understand the situation allows one to engage in a thoughtful response rather than a rash reaction.
Relaxation
A greater awareness of current mind/body conditions (e.g., racing thoughts and muscle tension) allows — to a certain extent — for the modification of these states, subsequently reducing stress.
Acceptance
By accepting states for what they are, one can learn to understand and tolerate them instead of engaging in maladaptive responses driven by fear and catastrophizing.

Note. Summarized from Baer (2006).

minimizing reflexive behaviour. Conditions involving poor self-regulation, excessive tension, avoidance, and maladaptive patterns of thought and behaviour (e.g., depressive rumination, anxiety, phobias, procrastination, and self-harm) may also benefit from each factor by varying degrees.

1.5 New Contexts

1.5.1 Mindfulness at Work

With numerous benefits being attributed to mindfulness, companies have been eager to explore its application in the workplace. Many major corporations, such as General Mills (Gelles, 2012), Aetna (Gelles, 2015), Goldman Sachs (Agnew, 2014), and Google (Confino, 2014), now provide mindfulness-based training programs to their employees and some have begun to commercialize their internally-developed interventions; Google's Search Inside Yourself, for instance, is now offered externally by the Search Inside Yourself Leadership Institute — a non-profit spin-off organization that boasts an impressive list of clients, including Comcast, Ford, Roche, Scotiabank, and ThyssenKrupp (Search Inside Yourself Leadership Institute, n.d.). Commonly reported outcomes from workplace mindfulness programs include reductions in stress and pain and improvements in sleep quality, productivity, and decision-making abilities among workers (Gelles, 2012, 2015). Some companies have even noted significant financial savings in health care costs, presumably due, in part, to the introduction of workplace wellness initiatives (Gelles, 2015).

Anecdotal reports of improved wellness and performance in the workplace following mindfulness training are largely supported by empirical studies (for a comprehensive review, see Lomas et al. [2017]), which have been conducted in the context of many occupational populations, including working parents (T. D. Allen & Kiburz, 2012), educators (Frank et al., 2015; Roeser et al.,

2013), restaurant servers and managers (Dane & Brummel, 2014), health care workers (Beach et al., 2013; Krasner et al., 2009; Krusche et al., 2020; Shapiro et al., 2005; Singh et al., 2006), nuclear power plant operators (Zhang et al., 2013; Zhang & Wu, 2014), military service-members (Jha et al., 2015), and corporate employees (Aikens et al., 2014; Nadler et al., 2020; Roche et al., 2014; Slutsky et al., 2019; Wolever et al., 2012). Relative to inactive or waitlist controls, MBIs implemented in the workplace have been found to increase levels of trait mindfulness (Aikens et al., 2014; Frank et al., 2015; Krusche et al., 2020; Nadler et al., 2020; Roeser et al., 2013; Wolever et al., 2012), emotional intelligence (Nadler et al., 2020), self-compassion (Frank et al., 2015; Roeser et al., 2013; Shapiro et al., 2005), and psychological resilience (Aikens et al., 2014; Nadler et al., 2020); enhance job satisfaction (Hülsheger et al., 2013), vigor (Aikens et al., 2014), working memory capacity (Roeser et al., 2013), psychological fulfilment (Krusche et al., 2020), and mood (Nadler et al., 2020); and reduce stress (Aikens et al., 2014; Krusche et al., 2020; Nadler et al., 2020; Roeser et al., 2013; Shapiro et al., 2005; Wolever et al., 2012), emotional exhaustion (Hülsheger et al., 2013), and sleep difficulties (Frank et al., 2015; Wolever et al., 2012). Mindfulness training has also been found to enhance leadership abilities (Nadler et al., 2020), increase empathy and decrease feelings of depersonalization and burnout (Krasner et al., 2009), and mitigate declines in attention that are induced by job-related stress (Jha et al., 2015). Research further suggests that even a single mindfulness seminar can increase productivity but longer programs seem to be necessary for eliciting changes in attention, job satisfaction, and work-life balance (Slutsky et al., 2019).

In non-experimental studies, employee trait mindfulness has been found to be negatively associated with emotional exhaustion (Hülsheger et al., 2013); turnover intention (Dane & Brummel, 2014); anxiety, depression, negative affect, and burnout (Roche et al., 2014); hostility and counterproductive

workplace behaviour (Krishnakumar & Robinson, 2015); and anger and rumination in response to unfair treatment in the workplace (Long & Christian, 2015). Positive relationships have also been observed between trait mindfulness and job satisfaction (Hülsheger et al., 2013); job performance (Dane & Brummel, 2014); sleep quality (T. D. Allen & Kiburz, 2012; Hülsheger et al., 2014); vitality and work-family balance (T. D. Allen & Kiburz, 2012); psychological detachment from work (Hülsheger et al., 2014); positive tone and client-focused communication (Beach et al., 2013); and safety compliance, particularly for high-complexity jobs (Zhang et al., 2013) and for experienced and intelligent workers (Zhang & Wu, 2014). Supervisor scores on the MAAS have additionally been found to be negatively associated with employee exhaustion and deviance and positively related to employee work-life balance, job performance, and satisfaction, implying that the effects of one's trait mindfulness are not restricted to the individual themselves (Reb et al., 2014).

1.5.2 Mindfulness at School

Much like corporations, universities have begun to offer mindfulness resources and workshops for their students and faculty (Counter, 2016) and institutes dedicated to the study of mindfulness and contemplation have emerged at places such as Brown University, Harvard, and the University of Ottawa (Academy for Mindfulness and Contemplative Studies, n.d.). Consistent with findings in other populations, MBIs in university[6,7] settings

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[6]The practice of mindfulness has also been studied in elementary and high school settings. The studies in this dissertation, however, are concerned exclusively with adult participants and, as a result, literature regarding children and adolescents will not be reviewed here. Instead, see Carsley et al. (2018), Felver et al. (2016), McKeering and Hwang (2019), and Zenner et al. (2014).

[7]As is common in human-based research, many of the studies reviewed in Section 1.4 involve student participants drawn from university populations. The literature reviewed here differs

have been associated with marked reductions in anxiety and stress (reviewed by Bamber & Kraenzle Schneider, 2016). Comparisons to inactive or waitlist controls have also linked MBIs to improvements in student adjustment (Ramler et al., 2016), spatial working memory, and attention (Ho et al., 2015; Morrison et al., 2014); increases in empathy (Barbosa et al., 2013; Shapiro et al., 1998), positive affect (Shapiro et al., 2007), self-compassion (Bergen-Cico et al., 2013; Erogul et al., 2014; Greeson et al., 2014; Hindman et al., 2015; Shapiro et al., 2007), and aspects of trait mindfulness (Baltzell & Akhtar, 2014; Bergen-Cico et al., 2013; Cavanagh et al., 2013; Goodman et al., 2014; Greeson et al., 2014; Hindman et al., 2015; Lynch et al., 2018; Ramler et al., 2016; Shapiro et al., 2007; Song & Lindquist, 2015); and reductions in depression (Cavanagh et al., 2013; Lynch et al., 2018; Shapiro et al., 1998; Song & Lindquist, 2015), negative affect (Shapiro et al., 2007), sleep problems (Greeson et al., 2014), and distress during exams (Galante et al., 2018). Results from studies employing active controls imply that mindfulness training has similar effects on student stress (Messer et al., 2016), distress, and positive mood (Jain et al., 2007) as somatic relaxation and is more effective at reducing stress than physical education interventions emphasizing posture and breathing (Gallego et al., 2015).

Research in colleges and universities have further revealed that undergraduate scores on the MAAS are positively related to adaptive coping styles (Palmer & Rodger, 2009), self-regulation (Ramli et al., 2018), and psychological well-being (Zimmaro et al., 2016) and are negatively correlated with maladaptive coping styles (Palmer & Rodger, 2009) and levels of academic (Ramli et al., 2018), perceived (Palmer & Rodger, 2009; Zimmaro et

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in that it concerns outcomes that are specifically applicable to students (e.g., grades, scores on standardized tests, etc.) and/or student participants appear to have been recruited because they were the target population rather than because they were a population of convenience.

al., 2016) and physiological (Zimmaro et al., 2016) stress. Positive relationships have also been found between scores on the Freiburg Mindfulness Inventory and both resilience and perceived academic efficacy (Keye & Pidgeon, 2013). Furthermore, moderation analyses have suggested that trait mindfulness — as measured by the FFMQ — is a significant moderator between self-care and psychological distress among medical students (Slonim et al., 2015) and that stress mediates a negative association between trait mindfulness and alcohol problems in undergraduates (Bodenlos et al., 2013).

1.5.3 Variation and Adaptations

Within the workplace and university-based mindfulness literature, there is substantial diversity in the interventions considered. Among the studies reviewed in sections 1.5.1 and 1.5.2, programs varied in length from 2 (Cavanagh et al., 2013; Hülsheger et al., 2013) to 18 (Ho et al., 2015) weeks and interventions included the standard 8-week MBSR program (Barbosa et al., 2013; Song & Lindquist, 2015); adaptations[8] of MBSR (Bergen-Cico et al., 2013; Erogul et al., 2014; Frank et al., 2015; Jain et al., 2007; Morrison et al., 2014; Ramler et al., 2016; Shapiro et al., 2005, 2007, 1998) and MBCT (Gallego et al., 2015); variations of other MBIs that were or have since become formalized and/or proprietary (Baltzell & Akhtar, 2014; Goodman et al., 2014; Greeson et al., 2014; Jha et al., 2015; Krusche et al., 2020; Nadler et al., 2020; Roeser et al., 2013; Wolever et al., 2012); and programs designed specifically for study purposes (Aikens et al., 2014; Cavanagh et al., 2013; Galante et al., 2018; Hindman et al., 2015; Ho et al., 2015; Hülsheger et al., 2013; Krasner et al., 2009; Lynch et al., 2018; Messer et al., 2016; Slutsky et

[8]Common adaptations of established MBIs include alterations to session length and/or intervention duration. Some variations of MBSR also forgo the all-day retreat.

al., 2019), many of which name MBSR and MBCT as sources of foundation and inspiration. Heterogeneity within the literature ultimately limits the generalizability of specific outcomes but, broadly, mindfulness seems to have a positive impact on workers and students alike.

1.6 New Techniques

Novel contexts coupled with advances in technology have begun to inspire novel techniques for MBI implementation. In particular, self-guided and online interventions have become increasingly popular in recent years. In fact, results from a cross-sectional survey of 500 Americans suggest that internet-based MBIs are preferred to in-person programs, including both individual and group-based formats (Wahbeh et al., 2014).[9]

Growing interest in self-directed mindfulness training has been mirrored by a proliferation of wearable tech devices that promote and/or support mindfulness practices. Fitbit and Apple smartwatches, for instance, offer regular deep breathing reminders and breath-focused exercises coupled with physiological monitoring. Similar features are provided by the Muse headband which yields real-time neurological feedback aimed at guiding users towards a more focused state of mind during meditation. The mindfulness-based mobile app industry has also seen significant growth — by 2017, Google Play and Apple's App Store were host to over 1000[10] self-

[9]It should, however, be noted that this survey was conducted online. Consequently, participants were likely technologically literate with positive opinions of the internet and the elderly and those of low socioeconomic status may have been underrepresented in the sample. These results, therefore, should be considered with caution.

[10]A systematic review has found that relatively few mindfulness apps provide genuine mindfulness training. Instead, many so-called mindfulness apps would be better classified as timers or relaxation/meditation-based apps (Mani et al., 2015). The number of actual mindfulness apps, therefore, is likely smaller than what has been reported.

proclaimed mindfulness apps (Garlick, 2017) and it has been calculated that meditation apps earned $195 million in 2019 alone (Williams, 2020).

Research regarding the efficacy of many apps is scarce (Plaza et al., 2013). Perhaps one of the most empirically-supported, however, is Headspace — an app created by former Buddhist monk Andy Puddicombe that features guided meditations and instructional material regarding mindfulness. Compared to active controls, use of the Headspace app has been found to enhance sustained attention and levels of trait mindfulness (Bennike et al., 2017), decrease irritability and stress (Economides et al., 2018), and reduce symptoms of depression (Howells et al., 2016). Slight advantages for the app over traditional in-person MBIs have also been observed. In particular, a 4-week Headspace intervention produced significantly greater increases on the FFMQ acting with awareness subscale than a 4-week in-person mindfulness program; use of the app was also associated with comparatively larger (but non-significant) improvements on the FFMQ non-reactivity subscale and measures of compassion satisfaction (i.e., the satisfaction one derives from performing their job well) and burnout (Morrison Wylde et al., 2017).

In addition to apps, research has explored online classrooms (Wolever et al., 2012), dedicated websites (Cavanagh et al., 2018, 2013; Messer et al., 2016; Nadler et al., 2020; Querstret et al., 2018; Shore et al., 2018), and combinations of the two (Aikens et al., 2014). Outcomes across all modalities have been generally positive, with a recent meta-analysis suggesting that online MBIs have a significant moderate-sized[11] effect on stress and small but significant effects on depression, anxiety, well-being, and trait mindfulness (Spijkerman et al., 2016). Studies employing waitlist controls have also linked online interventions to reductions in paranoia (Shore et al.,

[11]Hedges' *g* effect sizes were calculated in this meta-analysis (see Footnote 5).

2018) and perseverative thinking (Cavanagh et al., 2018) in nonclinical populations. Spijkerman et al. (2016) suggest that online MBIs produce smaller effects than face-to-face interventions but a direct comparison of otherwise equivalent programs found no notable outcome differences between an MBI delivered in a virtual versus (vs.) traditional classroom setting (Wolever et al., 2012).

Online interventions face many challenges. Some, for instance, report high rates of participant dropout and poor adherence (Christensen et al., 2009). Additionally, there is concern that web-based programs could engender inaccurate self-diagnosis and they typically offer less opportunity for treatment customization than can be achieved via one-on-one consultation with a health care provider (Andersson & Titov, 2014). There is also some evidence to suggest that programs incorporating clinician and/or instructor contact produce better results than self-guided programs (Johansson & Andersson, 2012; Spijkerman et al., 2016). Despite these potential drawbacks, however, there are many benefits inherent to internet-based approaches. In particular, online interventions are more cost efficient than face-to-face programs (Hedman et al., 2011); promote broad accessibility and timely access to treatment; permit repetition and review of material; accommodate personal schedules and paces of work; and allow for self-referral, meaning that issues associated with real or perceived stigmatization are minimized (Andersson & Titov, 2014).

1.7 Purpose of the Dissertation

The literature discussed throughout this chapter suggests that mindfulness has the potential to enhance health, wellness, and cognitive functioning. It has also highlighted current trends in the application and implementation of mindfulness-based training in workplace and university settings. This dissertation aims to add to the existing research by investigating the effects

of three MBIs that were offered to legal professionals (Chapter 2) and graduate students (Chapter 3).

Recent studies suggest that graduate students face higher rates of depression and anxiety than the general population (e.g., T. M. Evans et al., 2018; The Graduate Assembly, 2014). Variation in mental health concerns and help-seeking behaviour has also been observed across academic programs (H. K. Allen, Lilly, et al., 2020; Lipson et al., 2016; The Graduate Assembly, 2014), likely due to degree-specific differences in scholarly requirements, mental health awareness, and real or perceived stigma. Law students, for instance, show significant declines in well-being throughout the first year of their program (Sheldon & Krieger, 2004, 2007) and report greater rates of depression and anxiety than grad students in general, yet many are reluctant to seek help due to fears that their doing so will compromise admission to the bar (Organ et al., 2016). These problems, unfortunately, do not seem to abate following graduation, as depression, anxiety, and stress continue to be prevalent among practicing attorneys (Krill et al., 2016) — a fact that is particularly troubling given the important ways in which legal professionals contribute to society. In addition to notable mental health issues, studies have found high rates of substance abuse among graduate students (American College Health Association, 2019) and lawyers (Krill et al., 2016), implying that these groups lack the coping skills necessary to deal with the challenges that they face in effective and adaptive ways. The studies in this dissertation sought to address this problem by assessing the effectiveness of mindfulness training as an approach for managing stress and promoting wellness among these populations.[12]

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[12]A study was also conducted to assess the effects of two MBIs administered to law students. Unfortunately, however, meaningful analyses could not be conducted due to low rates of responding among participants.

All studies in this dissertation involved online data collection and MBIs with online components. Web-based modalities were used because they have been found to be effective (Spijkerman et al., 2016) and it was believed that lawyers and students would appreciate and benefit from the cost efficiency and flexibility that is afforded by internet-based programs. Studies reviewed in Section 1.5 suggest that MBIs can be successfully implemented in work- and university-based settings and that mindfulness can evoke positive changes in these environments. It was, therefore, anticipated that participation in an MBI would improve health and wellness for legal professionals and students alike.

1.8 Notes Regarding Analyses

In any intervention, there are bound to be participants who fail to complete the program as intended. An intention-to-treat analysis takes these individuals into account by including non-compliant participants. In doing so, intention-to-treat analyses provide a more accurate estimate of the real-world efficacy of an intervention than per-protocol (PP) analyses, which include only those who completed their assigned treatment as directed (Ranganathan et al., 2016). It is also typical in intention-to-treat approaches for missing data to be imputed using techniques such as last observation carried forward, which replaces missing data with each participants' previously observed measure or score (Gupta, 2011).

Analyses in this dissertation employed a modified intention-to-treat (mITT) approach, whereby non-compliant participants (i.e., participants who reported a failure to meditate during the studies and/or indicated that they had been simultaneously participating in multiple MBIs) were included. Missing data, however, was not imputed for three reasons.

(1) Imputation would have resulted in a substantial amount of estimated data, potentially complicating the interpretation of

results — something that would be particularly undesirable given that each study represents the first empirical assessment of each intervention.

(2) Because the assessments were conducted separately from the interventions, failure to respond to an assessment does not necessarily imply a failure to participate in the program; it would not, therefore, be correct to assume that those who failed to respond to an assessment had experienced no changes since the prior assessment period (i.e., to carry prior observations forward).

(3) Estimating responses on assessments that participants did not respond to seemed inappropriate given that, for two of the three studies, consent was obtained at the beginning of each individual assessment.

Participants were, therefore, included only in analyses of the assessments to which they responded to, though total completion of an assessment was not necessary for analysis inclusion; participants who failed to complete an assessment in its entirety were included in analyses for the scales in that assessment that they responded to and were omitted from analyses involving the measures they did not respond to. PP analyses were also conducted but are not reported in detail unless they produced results that deviated with respect to statistical significance from the results produced by the mITT analyses.

All analyses in this dissertation were conducted in R (version 3.6.3; R Core Team, 2020) and packages that have been used are listed in Appendix A. For all analyses, an alpha of .05 has been used and numbers greater than .001 have been rounded to two decimal places, except in cases where rounding would result in values of .00 (e.g., .003). The techniques implemented in each

analysis are specified in each section. Broadly, however, analyses include the following:

(1) Pearson's chi-square tests (χ^2) or, in cases where the necessary sample size was not met (see assumption 6 listed in McHugh, 2013), likelihood ratio chi-square tests (χ^2_{lr});

(2) independent *t*-tests or, when non-normality of residuals was identified via a Shapiro-Wilk test, Wilcox-Mann-Whitney tests (*z*);

(3) paired samples *t*-tests or, in cases of non-normality, Wilcoxon signed-rank tests (*z*);

(4) mixed analysis of variance (ANOVA; i.e., *F*-tests);

(5) analysis of covariance (ANCOVA; i.e., *F*-tests of adjusted means) or, in cases of heteroscedasticity and/or heterogeneity of slopes, Yuen's *t*-tests (t_Y); and

(6) linear regressions.

When Levene's test indicated heteroscedasticity in independent *t*-tests or ANOVAs, Welch's adjustments or white corrections were applied, respectively. Sphericity violations flagged by Mauchly's test for sphericity in ANOVAs were addressed with epsilon corrections — as suggested by Girden (1992), a Greenhouse-Geisser correction was applied when the Greenhouse-Geisser epsilon estimate was less than .75 and, when it was greater than .75, a Huynh-Feldt correction was used. Significant ANOVA interactions were further assessed via Holm-Bonferroni-corrected tests of simple main effects and significant simple main effects were followed by Holm post-hoc tests. In ANCOVAs, means have been adjusted (M_{adj}) to the grand mean (M_G) of the covariate and heteroscedasticity and/or heterogeneity of slopes was addressed by implementing a robust, non-parametric approach that uses Yuen's *t*-tests

to compare trimmed means (M_t) at specific levels of the covariate (Mair & Wilcox, 2020). Robust tests used a trim level of .20 and a smoothing parameter of 1 and comparison points were chosen by identifying all levels of the covariate that were closely[13] surrounded by 12 or more data points per group (as recommended by Mair & Wilcox, 2020) and selecting the minimum, median, and maximum values from that set; Holm-Bonferroni *p*-adjustments were used to account for the multiple comparisons being performed. Chi-square tests, t-tests, ANCOVAs, and Yuen's test are accompanied by Cramer's *V*, Cohen's *d*, generalized eta-square (η^2_G), and explanatory power (ξ) effect sizes, respectively. Effect sizes for Wilcox-Mann-Whitney and Wilcoxon signed-rank tests have been calculated as $r = z/\sqrt{n}$, where n is the number of observations for the Wilcox-Mann-Whitney test and the number of observation pairs for Wilcoxon signed-rank test.[14]

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[13]Values on the covariate (X_i) were deemed to be close to a comparison point (x) if $|X_i - x| \leq f \times (\text{MAD}/z_{.75})$, where f is the smoothing parameter, MAD is the median absolute deviation (i.e., the median of $|X_i - \tilde{X}|$), and $z_{.75}$ is the .75 quantile of the standard normal distribution (Mair & Wilcox, 2020). This calculation was repeated, substituting each unique value of X_i for x (i.e., each value of the covariate was considered as a potential comparison point). Values of X_i that were found to have at least 12 close points/group were identified and the minimum, median, and maximum values from that set were then selected as the comparison points of interest. For each comparison point, close values of X_i and their accompanying values on the dependent variable (i.e., X_i, Y_i observation pairs) were separated by group and each set of dependent values was trimmed. Groups were then compared via the means of these trimmed sets.

[14]Cramer's *V* is similar to a correlation coefficient (*r*) in that it provides information regarding the strength of association between two variables. The way in which V is calculated restricts it to positive values; *r*, on the other hand, ranges from -1.00 to 1.00, with the sign indicating whether the relationship is negative or positive in nature (Tomczak & Tomczak, 2014). Cohen's *d* is a measure of the standardized mean difference between two sets of observations and, for independent *t*-tests, can be interpreted as the number of standard deviations between two groups (Lakens, 2013). Eta-squared indicates the proportion of variation in the dependent variable that can be accounted for by the independent variable of interest. However, because eta-squared is calculated using sum of square values from the model being tested, standard forms of the statistic are not readily comparable across different samples and study designs; generalized eta-squared is calculated in a manner that improves comparability (Olejnik & Algina, 2003). The explanatory power effect size is a robust alternative to Cohen's *d* that allows for unequal sample sizes and heteroscedasticity (Wilcox & Tian, 2011).

Chapter 2

2 The Mindful Lawyer

In the late 1980's, Benjamin and colleagues conducted a pair of studies assessing mental health in the legal profession; the results of both were troubling. The first, which involved three groups comprised of a total of 320 students and alumni from the University of Arizona Law School, found a dramatic increase in the severity of depressive symptoms throughout the course of the law program (Benjamin et al., 1986). At the time, depression was estimated to affect approximately 3-9% of the population (Boyd & Weissman, 1981) and similar rates were found among those tested by Benjamin et al. in the summer prior to school. By the end of their final year, however, 40% of students reported scores on the Beck Depression Inventory that fell within the top 2% of non-clinical norms. Though this number had decreased by 2 years post-graduation, rates of depression did not return to pre-program levels, with 17% of alumni still scoring at or above the 98th percentile on this measure. Similar results were yielded by the Brief Symptom Inventory, on which 20% of the alumni scored within the top 2% on the depression subscale and 17.9% met the criteria for clinically relevant levels of psychological distress (Benjamin, et al., 1986). This overall pattern of results was subsequently mirrored by a study of 1,184 practicing lawyers from Washington state, of which 19% reported elevated levels of depression and 18% were further found to screen positive for alcohol abuse (Benjamin et al., 1990).

Over 25 years later, problems surrounding health and wellness remain prevalent in the American legal profession. In 2016, a study of over 11,000 American law students (Organ et al., 2016) found that 17% screened positive for depression and 37% screened positive for anxiety. Alcohol and illicit prescription drug use was also reported by 53% and 14% of students,

respectively (Organ et al., 2016). Similarly, in a survey of over 12,000 U.S. attorneys (Krill et al., 2016), average scores on the depression (M = 7.02) and stress (M = 9.94) subscales of the Depression Anxiety Stress Scales-21 (DASS-21) were found to be higher than American non-clinical norms ($M_{depression}$ = 5.70 and M_{stress} = 8.12; Sinclair et al., 2011).[15] Based on DASS-21 cut-offs for categories of symptom severity, Krill et al. (2016) further found that 28%, 19%, and 23% of the sample was experiencing above-normal levels of depression, anxiety, and stress, respectively.[16] Perhaps even more troubling is the fact that 11.5% of the sample had experienced suicidal ideation at some point during their career, 2.9% reported self-injuring, and .7% had attempted suicide. The Alcohol Use Disorders Identification Test also revealed problematic levels of alcohol use in 20.6% of the lawyers studied by Krill and colleagues (2016) and 36.4% screened positive on a subscale of this measure used to identify possible alcohol abuse and/or dependence; for comparison, a study of over 7000 surgeons found evidence of potential alcohol abuse using the same subscale in only 15.4% of the sample (Oreskovich et al., 2012).

Taken together, these studies imply that the legal profession has and continues to struggle with mental health challenges. Some (e.g., Doraisamy, 2015) suggest that this is because there are aspects of the job that can leave lawyers particularly prone to negative thoughts and emotions. Legal work,

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[15]Scores on the anxiety subscale were found to be slightly lower in Krill et al.'s (2016) sample ($M_{Krill\ et\ al.}$ = 3.92 vs. $M_{Sinclair\ et\ al.}$ = 3.99). Also, note that Sinclair et al. (2011) doubled their scores to be comparable with the DASS-42 while Krill et al. did not. The Krill et al. values presented here, therefore, have been multiplied by 2.

[16]It has been estimated that depression and anxiety affect approximately 18.1% and 6.7% of the U.S. population, respectively (Anxiety and Depression Association of America, n.d.). Comparisons between these values and those cited by Krill et al. (2016) should, however, be made with caution as the DASS-21 is not a clinically diagnostic measure (Psychology Foundation of Australia, 2018).

for instance, involves a great deal of focus as one manages interruptions while shifting attention between present work, past cases, previous and upcoming client meetings, and future court dates. Additionally, however, cognitively demanding tasks must be done with a high degree of perfection due to the lawyer's dual-responsibility for the reputation of their firm and the personal success of their clients. Competitiveness is encouraged, as are long hours, which can make it difficult to socialize or enjoy time away from the job. The practice of law also requires a certain degree of pessimism and detachment, as lawyers are forced to consider worst case scenarios and contingency plans while simultaneously dealing with the darker aspects of human life, such as death, divorce, custody disputes, theft, and violent crime. Complete detachment must be avoided though, if one hopes to build a positive rapport with their clients. At the same time, public perception of the field is largely negative and often unrealistic, with lawyers romanticized or vilified in fictional portrayals (Martin & Laws, 2018).

Ultimately, long hours spent immersed in challenging work and negative mindsets can fuel things like depression and dissatisfaction if healthy work/life boundaries are not maintained (Doraisamy, 2015). Unfortunately, many lawyers who do face issues such as these are reluctant to seek help due to social stigma, concerns regarding privacy and confidentiality, and the potential for adverse professional repercussions (Krill et al., 2016; Organ et al., 2016). Fear of social and professional fallout, coupled with a belief that problems can be dealt with by oneself, may explain the prevalence of ineffective coping strategies such as alcohol use which, in turn, likely perpetuate and amplify the issues at hand.

2.1 The Mindful Lawyer Studies

To be successful in the legal profession, one must possess a great attention to detail, the ability to adaptively detach, and well-developed emotional

intelligence skills (e.g., active listening and compassion) — all of which might be facilitated by mindfulness. It is unsurprising, therefore, that members of the legal profession have begun to explore the use of mindfulness in an effort to enhance functioning and improve well-being. Over the past 20 years, conferences and forums have been held to discuss the integration of mindfulness and law practices (Boyce, 2010; Riskin, 2002; *The proceedings of the mindful lawyer conference*, 2010), and many books and articles have been written on the topic (e.g., Leizerman & Rinsen Weik, 2018; Martin, 2018; Scott, 2018). Furthermore, the American Bar Association — which developed a national task force on lawyer health and wellness in direct response to the work of Organ et al. (2016) and Krill et al. (2016) (reviewed in Section 2; The National Task Force on Lawyer Well-Being, 2017) — lists many mindfulness-based resources on their website (American Bar Association, 2019). There is, therefore, a precedent for investigating the impact of mindfulness on legal professionals and the studies in this chapter sought to do so by assessing the outcomes associated with two web-based mindfulness programs developed for lawyers. Both studies were somewhat exploratory in nature because they represent the first time that either program has been examined empirically. However, based on the literature reviewed in Chapter 1, mindfulness training was expected to:

(1) alter perceptions of stress by encouraging awareness and cognitive reappraisal of potential stressors;

(2) improve mood by facilitating a greater sense of emotional awareness and regulation;

(3) enhance resilience by promoting adaptive responding aided by a reappraisal of potential stressors and a decrease in emotional reactivity;

(4) facilitate the development of trait mindfulness by encouraging a non-judgmental sense of awareness and decreased reactivity; and

(5) reduce the severity of symptoms associated with depression, anxiety, and stress by promoting cognitive reappraisal, an awareness of adaptive and maladaptive patterns of thought and behaviour, and relaxation.

It was also hypothesized that individuals with a history of meditation practice may have encountered less of a learning curve during the intervention, thus allowing for more in-depth engagement with the program and enhanced outcomes relative to those with no prior experience. Furthermore, it was anticipated that the magnitude of intervention outcomes would be positively related to the degree of program participation, which was operationalized in each study as time spent meditating.

2.2 Study 1

Study 1 employed a convenience sampling method and pre-post design to assess the effectiveness of the 8-week mindfulness program outlined in Cho and Gifford's (2016) book, *The Anxious Lawyer: An 8-Week Guide to a Joyful and Satisfying Law Practice Through Mindfulness and Meditation.*

2.2.1 Method

2.2.1.1 Participants

Participants were recruited from the National Association of Women Lawyers — a gender-inclusive group dedicated to the empowerment of women in the American legal profession — via a virtual book club sponsored jointly by the National Association of Women Lawyers and Seyfarth Shaw LLP. The book club had arranged to read and discuss *The Anxious Lawyer* (Cho & Gifford, 2016) and book club members were asked to attend three webinars for

continuing legal education credits. Attendees of the first webinar were invited to participate in a study being conducted in conjunction with, yet separately from,[17] the book club and, out of several hundred webinar attendees, 91 responded to at least one of the two assessments in the study. Individuals who participated in the study were not offered any compensation.

2.2.1.2 Intervention

The Anxious Lawyer was written by two individuals who have experience with both mindfulness and the legal profession. Cho, who is a partner at JC Law Group PC, has attended numerous mindfulness retreats and completed several courses in mindfulness, including the teacher training practicum for Kabat-Zinn's (1982) MBSR program. Gifford — a former attorney for the Federal Reserve Bank of New York — has practiced yoga-based meditation for 15 years and teaches mindfulness as an executive coach. In their book, Cho and Gifford provide an accessible introduction to mindfulness and practical examples of how mindfulness can be applied in various situations that are common in the practice of law (e.g., dealing with difficult clients, negotiating with opposing counsel, etc.). The book also outlines an 8-week program (detailed in Table 2.1) that pairs specific readings with both formal and informal mindfulness practices. Formal practices include guided meditations, which are presented in written form in the text and are also available in audio form narrated by the authors of the book at www.theanxiouslawyer.com. Informal practices encourage contemplation and

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[17]The design and evaluation of the mindfulness program was conducted by two, separate groups — the mindfulness program was created and administered by Cho and Gifford and survey preparation, data collection, and analysis was performed by Nielsen (i.e., the candidate) and Minda (i.e., Nielsen's supervisor). Participants were encouraged to answer the self-report assessments honestly and were assured that their individual data would not be accessible to anyone outside of the data analysis team. Nielsen and Minda are not, in any way, affiliated with the Anxious Lawyer program and declare no conflicts of interest.

Table 2.1. Summary of the 8-week mindfulness program outlined in *The Anxious Lawyer* (Cho & Gifford, 2016).

Week	Topic/Chapter	Formal Practice	Informal Practice
1	Beginning to Meditate	*Body Scan:* one 6-min meditation and one 24-min meditation, each focusing on the sensations felt in parts of the body	*Mindful Showering:* focus on physical sensations experienced while showering
2	Mindfulness	*Breathing Focused:* one 12-min meditation focused on the sensations of breathing	*Mindfulness in Daily Life:* brainstorm and select an activity to perform mindfully
3	Clarity	*Following Your Thoughts:* one 12-min meditation focused on the quality (as opposed to content) of one's thoughts	*Transitional Moments:* practice present moment awareness during times of transition between activities
4	Compassion Toward Others	*Compassion Toward Others:* one 12-min meditation focused on cultivating compassion for others	*Sending Good Wishes to Others:* practice sending silent good wishes to strangers encountered during the day
5	Self-Compassion	*Self-Compassion:* one 12-min meditation focused on cultivating compassion for the self	*Being Kind to Oneself:* ask "How can I be kind to myself?" and notice the resulting thoughts and feelings
6	Mantra Repetition	*Mantra:* two 6-min meditations involving the repetition of a mantra (i.e., a word or phrase designed to provide affirmation or motivation and/or aid in concentration)	*Mantra Repetition:* incorporate silent mantra repetition into other activities (e.g., while taking public transit)
7	Heartfulness	*Heart-Centered:* two 6-min meditations, each focusing on the heart	*A Higher Goal:* identify a personal ideal or goal and offer the performance of your daily activities to this goal
8	Gratitude	Repeat meditations from weeks 6 and 7	*Gratitude Journal/Jar:* write down things that you are grateful for in a journal or on slips of paper in a jar

suggest ways in which mindfulness can be incorporated into the activities of everyday life. Readers are encouraged to track their experiences with the various practices each week by completing meditation logs. The logs, which provide space to record the time and length spent practicing each day and notes regarding both the formal and informal activities, are included at the end of each chapter.

Participants were encouraged to read *The Anxious Lawyer* and to complete the accompanying 8-week program. The intervention was run entirely by Cho and Gifford who sent participants weekly emails that specified the book sections to be read and provided links to the online guided meditations; this material was also available throughout the program to participants via a website (http://theanxiouslawyer.com/syllabus/). Access to the guided meditations was not restricted, meaning that participants were not limited to one type of meditation per week.

2.2.1.3 Self-Report Assessments

Self-reports included a short demographic survey (included in Appendix B), a series of questions regarding prior experience with meditation and other contemplative practices (presented in Appendix C), and five psychological inventories which were selected based on their use in prior studies regarding mindfulness, mood, and well-being.[18] All measures were presented online via Qualtrics (2005) — an online data collection platform.

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[18]Participants in both Study 1 and Study 2 were also asked to complete a measure of perceived workplace effectiveness referred to as the Job Effectiveness Questionnaire (JEQ). This measure was designed specifically for use in this study. Because the JEQ has not been validated, however, associated analyses are presented in Appendix D rather than in the text.

2.2.1.3.1 Perceived Stress Scale

The Perceived Stress Scale (PSS; Cohen et al., 1983) is a 14-item questionnaire designed to measure one's perception of stressful events throughout the past month. Items, such as "How often have you been upset because of something that happened unexpectedly?" are rated on a five-point scale ranging from 0 (*never*) to 4 (*very often*). Scores are calculated by reverse scoring positively worded questions and then taking the sum of all items. Scores range from 0 – 56,[19] with high scores indicating a high level of perceived stress. Previous studies have found significant mindfulness-related reductions in scores on this measure (e.g., Aikens et al., 2014; Messer et al., 2016; Nadler et al., 2020; Shapiro et al., 2005; also, see Supplementary Table 8 from Lomas et al., 2017).

2.2.1.3.2 Positive and Negative Affect Schedule

The Positive and Negative Affect Schedule (PANAS; Watson et al., 1988) provides a measure of both positive and negative mood. Participants are presented with 20 mood descriptors (10 positive and 10 negative, intermixed), such as "Excited" and "Upset," and are asked to indicate the extent to which they have felt each mood during the past month. Ratings are made on a scale of 1 (*very slightly or not at all*) to 5 (*extremely*) and scores for the positive and negative subscales are calculated by summing responses to the positive and negative words, respectively. Scores on each subscale range from 10 – 50, with high scores representing high levels of positive and negative mood. Prior studies assessing MBI outcomes have found significant increases in scores on the positive affect subscale and decreases in scores on the negative affect subscale of this measure (e.g., Nadler et al., 2020; Shapiro et al., 2007).

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[19]The potential score ranges that are listed for each measure assume that participants respond to all of the items in each scale.

2.2.1.3.3 Brief Resilience Scale

The Brief Resilience Scale (BRS; Smith et al., 2008) is a six-item measure of psychological resilience. Items, such as "I tend to bounce back quickly after hard times," are rated on a five-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Scores are calculated by reverse scoring negatively worded statements and taking the average of all responses. Scores range from 1 – 5, with high scores indicating a high degree of resilience. Compared to a group of waitlist control participants, Nadler et al. (2020) found significant improvements on the BRS for those participating in an online, 8-week MBI.

2.2.1.3.4 Five Facet Mindfulness Questionnaire-24

The 24-item FFMQ (Bohlmeijer et al., 2011) includes five subscales, each of which measures an aspect of trait mindfulness — non-reactivity to inner experiences, observing, acting with awareness, describing, and non-judging of inner experiences. Items, such as "I'm good at finding the words to describe my feelings," are rated on a five-point scale from 1 (*never or very rarely true*) to 5 (*very often or always true*). Scores are calculated by reverse scoring negatively worded statements and summing the items within each subscale.[20] Scores on the observing subscale range from 5 – 20; all other subscales have a potential range of 5 – 25. High scores on each subscale suggest high levels of each trait mindfulness component. MBIs have been found to increase scores on the FFMQ, though considerable variation has been observed across the

[20]In some studies (e.g., Cavanagh et al., 2013; Hindman et al., 2015; Krusche et al., 2020; Roeser et al., 2013), a global score is calculated by summing all items together. In a review of workplace-based MBIs, however, Lomas et al. (2017) note that most studies "did not find a uniformly positive improvement in mindfulness, but only in facets of it, which shows the importance of analyzing its various components separately" (p. 507). This dissertation, therefore, considers each subscale individually.

individual subscales (e.g., see Supplementary Table 6 from Lomas et al., 2017), likely due to diversity in MBI curriculums.

2.2.1.3.5 Depression Anxiety Stress Scales-21

The DASS-21 (Lovibond & Lovibond, 1995) includes three subscales that provide a measure of the severity of symptoms associated with depression, anxiety, and stress. Respondents are asked to consider their experience over the past week and rate items, such as "I couldn't seem to experience any positive feeling at all," on a four-point scale from 0 (*never*) to 3 (*almost always*). Scores are calculated by summing the items within each subscale and multiplying the resulting values by 2. Scores on each subscale range from 0 – 42, with high scores representing a high severity of symptomatology associated with depression, anxiety, and stress. The DASS-21 also specifies ranges for the purpose of classifying scores as being indicative of symptoms that are normal, mild, moderate, severe, and extremely severe. Research suggests that MBIs are capable of reducing scores on all three subscales of the DASS (e.g., see supplementary tables 7, 8, and 10 from Lomas et al., 2017).

2.2.1.4 Procedure

After the introductory book club webinar, participants were provided with a link for a Time 1 (T1) assessment. A letter of information (LOI) at the beginning of this assessment explained that participants would be asked to complete two assessments and that consent would be inferred by way of continued participation in the study procedures. To proceed with the assessment, participants were required to click a button indicating that they had read the LOI and consented to participate in the study. Participants were also given the opportunity to download a copy of the LOI for their records. After providing consent, participants were asked to enter their email address; email addresses were only used for the purpose of linking responses

across the two assessments and were replaced in the dataset with ID numbers after matching had occurred. Participants were then presented with the demographic survey, questions regarding prior contemplative experience, PSS, PANAS, BRS, FFMQ-24, and DASS-21. The order of these measures was randomly selected prior to the study and the same order was used for all participants.

Following the T1 assessment, participants began the mindfulness program. Instructions on how often to meditate throughout the program were not overly prescriptive but participants were advised to find a time that allowed them to practice as often as they could on a regular basis. Participants were also reminded to make note of when and for how long they meditated each time that they practiced. Halfway through the program, a second webinar was conducted to provide members of the book club a chance to discuss *The Anxious Lawyer* and ask questions; though study participants were not required to attend this webinar, they were encouraged to do so. After the final week of the mindfulness program, participants were provided with a link for a Time 2 (T2) assessment. With the exception of the demographic survey — which was replaced by a series of questions related to participation in the program (presented in Appendix E) — the T2 assessment was identical to the T1 assessment. Debriefing was done during a third book club webinar at the end of the program. Study procedures were conducted in accordance with an ethics protocol approved by Western's Research Ethics Board (REB; see Appendix F).

2.2.2 Results

The Study 1 dataset is available on Open Science Framework (OSF; https://osf.io/tu74a/). Psychological assessments were scored as described in Section 2.2.1.3 and T1 items regarding previous meditation experience were coded (as described in Appendix C) to create a measure of the number of

years, approximately, that participants had practiced meditation for prior to the study. T2 items related to participation in the program were used to create a measure of the number of minutes per week, on average, that participants reported meditating for throughout the intervention (see Appendix E). PP analyses in this study differed from mITT analyses in that they excluded participants who did not actively participate in the intervention.

2.2.2.1 Time 1 and 2 Comparisons

T1 and T2 scores on each measure were compared using paired samples *t*-tests or, in cases of non-normality, Wilcoxon signed-rank tests.

2.2.2.1.1 Participant Attrition

Ninety participants provided responses to the T1 assessment. Of these 90, 45 responded to the T2 assessment, resulting in an attrition rate of 50.00%. Likelihood ratio chi-square tests indicated that participants who did and did not respond to the T2 assessment differed with respect to their education and the type of firm in which they worked; $\chi^2_{lr}(2, N = 90) = 9.51$, $p = .01$, $V = .31$ and $\chi^2_{lr}(5, N = 90) = 11.11$, $p = .05$, $V = .31$, respectively. Pairwise comparisons employing a Holm-Bonferroni *p*-adjustment further revealed that rates of attrition were higher among those with a master's/doctoral degree (73.91%) than among those with a professional degree (43.08%) and were higher among those who reported working in boutique firms (i.e., small firms specializing in a particular niche; 100%) than among solo practitioners (33.33%); $\chi^2(1, N = 88) = 6.46$, $p_{adj} = .03$, $V = .27$ and $\chi^2_{lr}(1, N = 24) = 10.36$, $p_{adj} = .02$, $V = .58$, respectively. Attrition was not found to be affected by gender, job position, age, length of time spent working in one's current position, number of hours per week spent working, or length of previous meditation experience; $\chi^2(1, N = 90) = .08$, $p = .78$, $V = .03$; $\chi^2(2, N = 90) = .69$, $p = .71$, V

= .09; z = -0.69, p = 0.49, r = -0.07; z = 0.60, p = 0.55, r = 0.06; z = 1.75, p = 0.08, r = 0.19; and z = -0.19, p = 0.86, r = -0.02, respectively.

2.2.2.1.2 Modified Intention-to-Treat Analyses

For mITT analyses, n = 45; characteristics of these 45 participants are presented in Table 2.2. Score distributions[21] for each outcome measure are presented in Figure 2.1 and descriptive statistics are displayed in Table 2.3. Scales generally displayed adequate levels of internal consistency (i.e., $\alpha \geq .70$; see Table 2.4), though Cronbach's alpha was found to be low for the anxiety subscale of the DASS-21 both at T2 and overall.

2.2.2.1.2.1 Perceived Stress Scale

Analyses revealed a significant T1 to T2 decrease in scores on the PSS; $t(44) = 8.08$, $p < .001$, $d = 1.20$.

2.2.2.1.2.2 Positive and Negative Affect Schedule

Analyses revealed a significant T1 to T2 increase in scores on the positive affect subscale and decrease in scores on the negative affect subscale of the PANAS; $t(44) = -4.71$, $p < .001$, $d = -.70$ and $t(44) = 4.78$, $p < .001$, $d = .71$, respectively.

2.2.2.1.2.3 Brief Resilience Scale

Analyses revealed a significant T1 to T2 increase in scores on the BRS; $t(44) = -3.26$, $p = .002$, $d = -.49$.

2.2.2.1.2.4 Five Facet Mindfulness Questionnaire-24

Analyses revealed significant T1 to T2 increases in scores on all subscales of

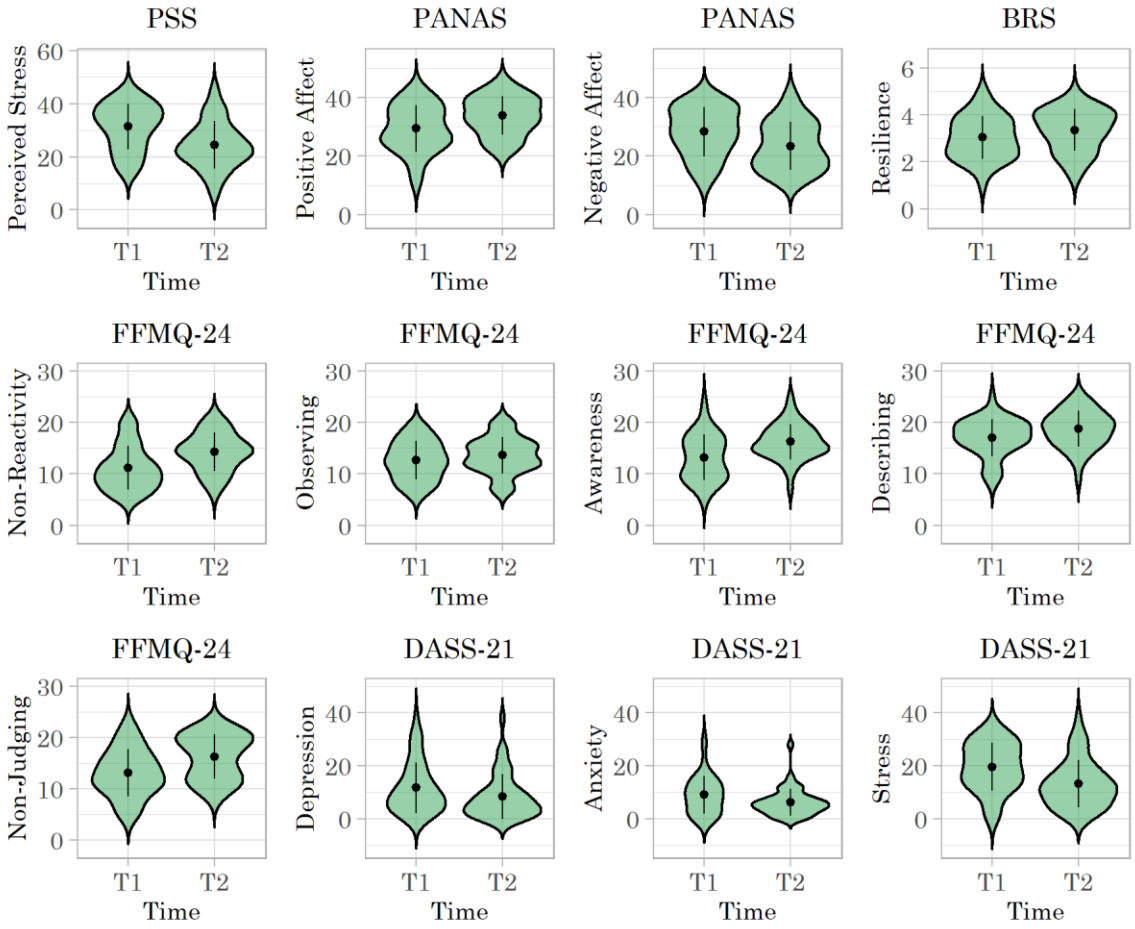
[21]Scores are presented via violin plots, which display smoothed density distributions. Due to smoothing, distribution tails may extend beyond the possible range of scores.

Table 2.2. The Mindful Lawyer Study 1 — Modified Intention-to-Treat Time 1 and 2 Comparisons: Participant characteristics.

Characteristic	*n*	*M*	*SD*
Age (Years)	45	46.00	11.06
Years in Current Position	45	8.86	9.14
Hrs/Week Worked	44	42.00	11.14
Previous Meditation Experience (Years)	45	4.83	11.70
Meditation During the Program (Mins/Week)	45	46.21	59.45
Gender			
Male	8		
Female	37		
Highest Level of Education			
Professional Degree	37		
Master's/Doctoral Degree[a]	6		
Other[b]	2		
Position			
Partner	11		
Non-Partner Attorney	19		
Other	15		
Law Firm Type			
Am Law 200	9		
Small Firm	13		
Solo Practitioner	12		
In-House Counsel	4		
Other	7		

[a]Master's (n = 1) and doctoral degree response categories have been combined. [b]Other includes the 2-year college diploma and 3-4-year university degree response options (for each, n = 1)

Figure 2.1. The Mindful Lawyer Study 1 — Modified Intention-to-Treat Time 1 and 2 Comparisons: Distributions of scores on each of the outcome measures.



Note. Score distributions are shown for the Perceived Stress Scale (PSS); the positive and negative affect subscales of the Positive and Negative Affect Schedule (PANAS); the Brief Resilience Scale (BRS); the non-reactivity, observing, awareness, describing, and non-judging subscales of the Five Facet Mindfulness Questionnaire-24 (FFMQ-24); and the depression, anxiety, and stress subscales of the Depression Anxiety Stress Scales-21 (DASS-21). Scores are depicted at Time 1 (T1) and Time 2 (T2). Dots and whiskers represent means and standard deviations, respectively.

Table 2.3. The Mindful Lawyer Study 1 — Modified Intention-to-Treat Time 1 and 2 Comparisons: Means and standard deviations for each measure.

Measure	Time 1 ($M \pm SD$)	Time 2 ($M \pm SD$)
Perceived Stress Scale*		
	31.44 ± 8.64	24.51 ± 8.82
Positive and Negative Affect Schedule		
Positive Affect*	29.33 ± 7.88	33.76 ± 6.52
Negative Affect*	28.24 ± 8.31	23.42 ± 8.15
Brief Resilience Scale*		
	3.03 ± .91	3.36 ± .89
Five Facet Mindfulness Questionnaire-24		
Non-Reactivity*	11.18 ± 4.24	14.29 ± 3.70
Observing*	12.67 ± 3.73	13.67 ± 3.55
Awareness*	13.22 ± 4.39	16.27 ± 3.41
Describing*	17.07 ± 3.63	18.78 ± 3.53
Non-Judging*	13.16 ± 4.61	16.29 ± 4.33
Depression Anxiety Stress Scales-21		
Depression*	11.73 ± 9.56	8.40 ± 8.37
Anxiety*	9.02 ± 7.13	6.27 ± 5.13
Stress*	19.56 ± 9.01	13.20 ± 8.88

*$p \leq .05$.

Table 2.4. The Mindful Lawyer Study 1 — Modified Intention-to-Treat Time 1 and 2 Comparisons: Internal consistency (α) of the scales used.

Measure	Time 1	Time 2	Overall
Perceived Stress Scale			
	.91	.91	.92
Positive and Negative Affect Schedule			
Positive Affect	.91	.88	.91
Negative Affect	.88	.90	.90
Brief Resilience Scale			
	.91	.92	.92
Five Facet Mindfulness Questionnaire-24			
Non-Reactivity	.91	.85	.90
Observing	.83	.89	.86
Awareness	.89	.83	.88
Describing	.80	.83	.82
Non-Judging	.86	.87	.88
Depression Anxiety Stress Scales-21			
Depression	.88	.91	.89
Anxiety	.70	.63	.68
Stress	.87	.90	.90

the FFMQ-24; non-reactivity, $t(44) = -5.82$, $p < .001$, $d = -.87$; observing, $z = -2.63$, $p = .01$, $r = -.39$; awareness, $t(44) = -5.73$, $p < .001$, $d = -.85$; describing, $z = -3.29$, $p < .001$, $r = .49$; and non-judging, $t(44) = -4.99$, $p < .001$, $d = -.74$.

2.2.2.1.2.5 Depression Anxiety Stress Scales-21

The spread of participants across each of the DASS-21 severity categories is outlined in Table 2.5; for comparison's sake, severity data from Krill et al. (2016) is presented in Table 2.6. Symptoms of above-normal severity were reported at higher rates across both time points in this study than in Krill et al. (2016). In general, however, the data suggests a decline in symptom severity over time, with T1 to T2 increases in the percentage of participants falling into the normal category of all three subscales and decreases in almost all of the other categories. (There appears to have been a T1 to T2 increase in the percentage of participants with mild anxiety symptoms but this likely reflects a downward shift in participants from the moderate, severe, and extremely severe categories.) This conclusion was supported by analyses which revealed significant T1 to T2 decreases in scores on all subscales of the DASS-21; depression, $z = 2.99$, $p = .002$, $r = .45$; anxiety, $z = 2.96$, $p = .003$, $r = .44$; and stress, $t(44) = 5.81$, $p < .001$, $d = .87$.

2.2.2.1.3 Per-Protocol Analyses

Of the 45 participants who responded to both the T1 and T2 assessments, one indicated that they did not meditate at all throughout the program. For PP analyses, therefore, $n = 44$. All results from PP analyses were found to be comparable to the results from mITT analyses.

2.2.2.2 Moderation of Change Over Time

Exploratory analyses were conducted to determine whether the change in each outcome measure was moderated by length of previous meditation experience or amount of program participation. Moderation was tested via

Table 2.5. The Mindful Lawyer Study 1 — Modified Intention-to-Treat Time 1 and 2 Comparisons: Percentage of participant responses on the Depression Anxiety Stress Scales-21 that fall in each of the symptom severity categories.

	Depression		Anxiety		Stress	
Symptom Severity	Time 1	Time 2	Time 1	Time 2	Time 1	Time 2
Normal	48.89	64.44	42.22	66.67	33.33	66.67
Mild	17.78	13.33	8.89	13.33	13.33	8.89
Moderate	15.56	13.33	31.11	15.56	17.78	11.11
Severe	6.67	6.67	11.11	2.22	31.11	11.11
Extremely Severe	11.11	2.22	6.67	2.22	4.44	2.22

Note. $n = 45$.

Table 2.6. Percentage of responses on the Depression Anxiety Stress Scales-21 from Krill et al. (2016) that fall in each of the symptom severity categories.

Symptom Severity	Depression[a]	Anxiety[b]	Stress[c]
Normal	71.67	80.70	77.30
Mild	9.53	8.63	8.81
Moderate	10.39	5.01	8.16
Severe	4.03	2.53	4.45
Extremely Severe	4.37	3.14	1.29

Note. Krill et al. (2016) did not multiply DASS-21 responses by 2. Comparisons to the percentages in this table, therefore, should be made with caution as the category cut-offs for non-multiplied DASS-21 values may not be directly comparable with the cut-offs for values that have been doubled (i.e., the DASS-42 cut-offs). [a]$n = 12{,}300$. [b]$n = 12{,}277$. [c]$n = 12{,}271$.

the method described in Case 2 of Judd et al. (2001). According to this method, moderation in a within-subject design can be estimated by performing a regression analysis with change over time as the dependent variable and the suspected moderator as the independent variable. Moderation, in this case, is present if the independent variable (i.e., the moderator) is found to be a significant predictor of the observed changes. For each outcome measure, change over time was calculated as T2 scores – T1 scores. The individual moderating effects of experience and participation were then assessed for each measure with separate regression analyses.

2.2.2.2.1 Modified Intention-to-Treat Analyses

Regression results are presented in Tables 2.7 and 2.8. Because each regression included only one predictor, the significance test of each model (i.e., the overall *F*-test) is essentially identical to the significance test of the coefficients (i.e., the *t*-tests conducted on the *B* values). Consequently, coefficient-level significance tests are not provided; coefficient values are, however, listed because they specify the amount of change in each outcome variable that can be predicted by a 1-unit change in each predictor.

Length of previous meditation experience was found to be a significant moderator of change in scores on the positive affect subscale of the PANAS (see Figure 2.2). In general, more experience appears to have been associated with less positive change (i.e., smaller increases) in positive affect over time. Note, however, that the relationship appears to be driven largely by six participants who reported between 20.00 and 50.00 years of experience. Using a standard cut-off of 1.5 × the interquartile range, these six responses were identified as outliers in the sample, as were two participation responses corresponding to 262.50 and 280.00 minutes of meditation per week. The removal of outlier responses ultimately rendered the relationship between experience and change in positive affect non-significant. Outlier removal did

Table 2.7. The Mindful Lawyer Study 1 — Modified Intention-to-Treat Moderations: Change over time moderated by years of previous meditation experience.

	All Participants[a]				Outliers Removed[b]			
Measure	R^2	F	p	B	R^2	F	p	B
Perceived Stress Scale								
	.04	1.84	.18	.10	.01	.34	.56	-.71
Positive and Negative Affect Schedule								
Positive Affect	.11	5.07	.03*	-.17	.01	.28	.60	-.68
Negative Affect	.03	1.19	.28	.10	.01	.24	.63	.75
Brief Resilience Scale								
	.04	1.87	.18	-.01	.005	.17	.68	.06
Five Facet Mindfulness Questionnaire-24								
Non-Reactivity	.02	.86	.36	-.04	.06	2.19	.15	1.18
Observing	.01	.27	.60	-.02	.04	1.59	.22	-.60
Awareness	.06	2.98	.09	-.08	< .001	.01	.92	.08
Describing	.03	1.28	.26	-.05	.01	.31	.58	-.40
Non-Judging	.002	.07	.79	-.02	.003	.13	.72	-.33
Depression Anxiety Stress Scales-21								
Depression	.01	.46	.50	.06	.02	.94	.34	-1.39
Anxiety	< .001	.004	.95	.01	.02	.75	.39	1.25
Stress	.08	3.91	.05[c]	-.18	< .001	.02	.90	.20

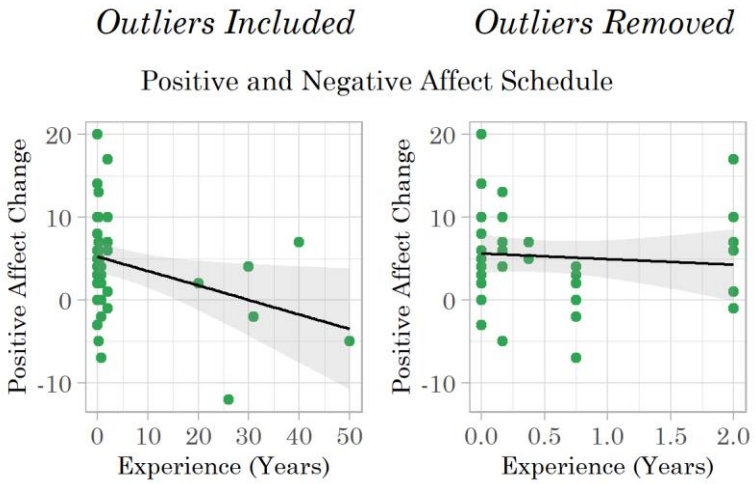
Note. Change was calculated as Time 2 – Time 1. [a]$df = 1, 43$. [b]$df = 1, 37$. [c]This number has been rounded to two decimal places but is, in fact, > .05. *$p \leq .05$.

Table 2.8. The Mindful Lawyer Study 1 — Modified Intention-to-Treat Moderations: Change over time moderated by minutes per week spent meditating during the program.

	All Participants[a]				Outliers Removed[b]			
Measure	R^2	F	p	B	R^2	F	p	B
Perceived Stress Scale								
	.02	.67	.42	-.01	.09	3.81	.06	-.05
Positive and Negative Affect Schedule								
Positive Affect	.02	.88	.35	-.02	< .001	.03	.87	.005
Negative Affect	.005	.20	.66	-.01	.02	.80	.38	-.03
Brief Resilience Scale								
	.02	.72	.40	.001	.01	.21	.65	.001
Five Facet Mindfulness Questionnaire-24								
Non-Reactivity	< .001	.01	.92	< .001	.03	1.20	.28	.02
Observing	.01	.29	.59	-.003	.01	.24	.63	-.01
Awareness	.01	.42	.52	-.01	.01	.25	.62	-.01
Describing	.01	.41	.53	.01	.06	2.60	.11	.02
Non-Judging	.01	.41	.53	-.01	.02	.87	.36	.02
Depression Anxiety Stress Scales-21								
Depression	.01	.59	.45	-.01	.07	3.17	.08	-.06
Anxiety	.03	1.28	.26	-.02	.04	1.68	.20	-.04
Stress	.002	.09	.77	-.01	.03	1.31	.26	-.04

Note. Change was calculated as Time 2 – Time 1. [a]$df = 1, 43$. [b]$df = 1, 41$.

Figure 2.2. The Mindful Lawyer Study 1 — Modified Intention-to-Treat Moderations: Changes in positive affect as a function of previous meditation experience.



Note. Figures depict the moderating relationship between years of meditation experience and changes in scores on the positive affect subscale of the Positive and Negative Affect Schedule both before (left) and after (right) outlier removal. Change was calculated as Time 2 – Time 1. The shaded area represents a 95% confidence region.

not have an effect on any of the other regressions (i.e., all remained non-significant).

2.2.2.2.2 Per-Protocol Analyses

All results from PP analyses were found to be comparable to the results from mITT analyses.

2.2.3 Discussion

As predicted, increases in positive affect, psychological resilience, and aspects of trait mindfulness were observed, as were decreases in perceived stress; negative affect; and the severity of symptoms associated with depression, anxiety, and stress. Cho and Gifford's (2016) 8-week mindfulness program, therefore, seems to have been effective in enhancing aspects of trait mindfulness and improving the well-being of the legal professionals who participated in the study. Individuals with master's or doctoral degrees seemed to have been less likely to participate than those with professional degrees, though the attrition rate among those with master's and doctoral degrees may have been exaggerated by the relatively small T1 sample size for this group ($n_{\text{master's/doctoral}} = 23$ vs. $n_{\text{professional}} = 65$). Differential rates of attrition between solo practitioners and those working in boutique firms may also have been influenced by differences in T1 sample sizes ($n_{\text{solo practitioners}} = 18$ vs. $n_{\text{boutique firms}} = 6$) or, perhaps, boutique firm employees were less inclined to participate because they did not believe that the program would be relevant given the niche nature of their work.[22]

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[22]It is, of course, possible that participants who did not respond to the study surveys did, in fact, participate in the intervention. For the purpose of discussion, however, it has been assumed that participants who failed to complete the assessments also failed to complete the program.

Moderation analyses suggest that changes evoked by the program were relatively independent from length of previous meditation experience and degree of program participation, though individuals with extensive experience demonstrated smaller changes in positive affect than individuals with little or no experience. One explanation for this relationship between experience and mood is that, over time, the practice of meditation increases positive affect to such an extent that, for those with considerable experience, further increases are unlikely (i.e., a ceiling effect). This interpretation seems improbable, however, given that an assessment of T1 scores on the positive affect subscale of the PANAS revealed no outliers, meaning that those with substantial experience did not begin the study with exceptionally high levels of positive mood. Furthermore, only one of the six experience-based outliers — in particular, a participant with 26 years of experience — was also classified as an outlier with respect to change on the positive affect subscale (demonstrating a T1 to T2 decrease of 12 points). Consequently, experience does not seem to temper the amount of positive change than can be achieved throughout the program. It is possible though, that individuals with a well-developed personal practice were bored or displeased with the structure and introductory-level nature of the intervention; future studies should incorporate questions designed to assess participant enjoyment of the program under consideration.

In general, the Anxious Lawyer program (Cho & Gifford, 2016) seems to have had the intended effect of improving mood and subjective well-being and the real-world efficacy of this program is supported by the convergence of results from mITT and PP analyses. It is important to note, however, that the convenience sampling procedure used in this study precluded the inclusion of a control group, meaning that one cannot rule out the possibility that the changes observed are due simply to the passage of time. As a result, though

the significant findings and general trends within the data are promising, these results should be interpreted with caution.

2.3 Study 2

Study 2 assessed the effectiveness of Mindful Pause — a 1-month program adapted from *The Anxious Lawyer* (Cho & Gifford, 2016) by Cho. As in Study 1, Study 2 used a pre-post design, though Study 2 also implemented random assignment to either an experimental group or a waitlist control group to allow for both between-group and within-group comparisons.

2.3.1 Method

2.3.1.1 Participants

One hundred employees from the American branch of a large, international law firm were recruited to participate in the Mindful Pause program in exchange for continuing legal education credits. Program participants were randomly assigned to either an experimental or waitlist control group (n = 50 for both). The experimental group was provided with a program start-date that was shortly after random assignment occurred and the waitlist control group was given a start-date that was after the experimental group's program was scheduled to end. Program participants were invited to participate in a study being conducted in conjunction with, yet separately from,[23] the program and, of the 100 individuals recruited for the program, 95

[23]As in Study 1, the design and evaluation of the mindfulness program was conducted by separate groups of personnel — participants were recruited by an employee of the law firm; the mindfulness program was created and administered by Cho; and survey preparation, group randomization, data collection, and analysis was performed by Nielsen and Minda. Participants were encouraged to answer the self-report assessments honestly and were assured that their individual data would not be accessible to anyone outside of the data analysis team. Nielsen and Minda are not, in any way, affiliated with the Mindful Pause program and declare no conflicts of interest.

responded to at least one of the three assessments in the study. Individuals who participated in the study were not offered any compensation.

2.3.1.2 Intervention

Each iteration of the Mindful Pause program was conducted over 30 consecutive days. Throughout the program, participants were sent daily emails containing brief information on topics including mindfulness and meditation, the management of stress and anxiety, and the use of cognitive resetting to address maladaptive patterns of thought. Emails also contained links to 6-minute, online guided meditations narrated by Cho. Additional program details are available at https://jeenacho.com/mindful-pause/.

2.3.1.3 Self-Report Assessments

With the exception of some alterations to the demographic survey and prior experience questions (highlighted in appendices B and C, respectively), self-reports were identical to the ones used in Study 1 (see Section 2.2.1.3). As in Study 1, all measures were presented online via Qualtrics (2005).

2.3.1.4 Procedure

At the beginning of the study, all participants were asked to complete a T1 assessment, consisting of the demographic survey, questions regarding prior contemplative experience, PSS, PANAS, BRS, FFMQ-24, and DASS-21. These measures were presented in the same order as in Study 1 and the same order was used for all participants. Participants in the experimental condition were then invited to attend a 1-hour webinar that provided an introduction to mindfulness and an overview of the study timeline. Following the webinar, participants in the experimental condition began the 30-day Mindful Pause program. Instructions on how often to meditate were not overly prescriptive but participants were advised to find a time that allowed them to practice as often as they could on a regular basis. Participants were

reminded to make a note of when and for how long they meditated each time that they practiced. Participants in the waitlist control condition were not given any instructions during this 30-day period.

After the experimental group had finished the program, all participants were asked to complete a T2 assessment. The T2 assessment was identical to the T1 assessment with the following exceptions: (1) the demographic survey was removed and, (2) for participants in the experimental condition, questions regarding program participation were added. The experimental group was then invited to attend a debriefing webinar while participants in the waitlist control condition were invited to attend an introductory webinar and begin the 30-day Mindful Pause program. Participants in the experimental condition were not given any instructions during this 30-day period. After the control group had finished the program, all participants were asked to complete a Time 3 (T3) assessment. The T3 assessment was identical to the T2 assessment with the following exceptions: (1) questions regarding program participation were provided to participants in the waitlist control condition and (2) participants in the experimental condition were asked whether they had continued to practice meditation on their own in the 30 days since they had completed the program. (Questions regarding program participation and continued practice are available in appendices E and G, respectively.) Following the T3 assessment, participants in the control condition were invited to attend a debriefing webinar.

Each of the three assessments began with a LOI that explained the study procedures and indicated that consent would be inferred by way of continued participation in the study. To proceed with each assessment, participants were required to click a button to express that they had read the LOI and consented to participate. Participants were also given the opportunity to download a copy of the LOI for their records. Participant email addresses were used to link responses across the three assessments and were replaced

in the dataset with ID numbers after matching had occurred. Study procedures were conducted in accordance with an ethics protocol approved by Western's REB (see Appendix F).

2.3.2 Results

The Study 2 dataset is available on OSF (https://osf.io/qrxz8/). Psychological assessments were scored as described in Section 2.2.1.3 and variables were created to represent years of previous meditation experience (see Appendix C; this variable was created from items in the T1 assessment) and minutes per week spent meditating during the program (see Appendix E; these items appeared in the T2 assessment for the experimental group and the T3 assessment for the waitlist control group). PP analyses in this study differed from mITT analyses in that they excluded participants who did not actively participate in the intervention.

2.3.2.1 Comparisons Across All Three Time Points

An analysis plan registered on OSF proposed performing a 2 x 3 mixed ANOVA for each measure with condition as a between-group factor and time as a within-group factor. However, of the 100 participants enrolled in the study, only 38 ($n_{\text{Experimental}} = 18$) responded to all three assessments. Among these 38 was one participant in the waitlist control condition who failed to respond to the FFMQ-24 and the DASS-21 in the T3 assessment; this participant was omitted from analyses involving these two scales. For mITT analyses, therefore, $n = 38$ or 37. For PP analyses, $n = 37$ or 36 because one participant in the experimental condition indicated that they did not meditate at all throughout the program.

mITT analyses revealed a significant overall decrease in perceived stress across all three time points (i.e., from T1 to both T2 and T3 and from T2 to T3) and a decrease in negative affect and the severity of symptoms associated

with depression and stress from T1 to both T2 and T3; a T1 to T2/T3 increase in awareness was also observed, as was a T1 to T3 increase in resilience, non-reactivity, observing, and non-judging. PP results were comparable to mITT results with the following exceptions: (1) T2 to T3 changes in perceived stress were not significant and (2) T1 to T2/T3 increases in observing were found to be significant but only for participants in the experimental condition (i.e., there was a significant interaction between condition and time).

Both sets of analyses produced a number of effects that were nearing significance (i.e., $.05 < p \leq .10$). Given the number of these nearly significant effects — six in the mITT analyses and five in the PP analyses — it seems possible that results were influenced or obscured by the small number of observations analyzed; had a larger sample been considered, nearly significant effects may have been found to be statistically significant and measures with significant main effects may have yielded significant interactions. Ultimately though, drawing generalizable conclusions from a small sample in a 2 x 3 mixed design is challenging. As a result, these analyses are presented in Appendix H and will not be discussed in detail. Instead, program-related effects were assessed by analyzing condition-specific differences at T2 (i.e., the time after which the experimental condition had completed the program and the control condition had received no instruction). Program-related changes among control participants were also assessed by performing T2 and T3 comparisons.

2.3.2.2 Time 2 Comparisons

For each measure, condition-specific differences in T2 scores were assessed using an ANCOVA, with condition as the independent variable, T2 scores as the dependent variable, and T1 scores as the covariate. This approach controls for group differences at T1 and provides greater power in randomized studies than can be achieved via a standard ANOVA (Van

Breukelen, 2006). In cases of heteroscedasticity and/or heterogeneity of regression slopes, trimmed means were compared at specific levels of the covariate via Yuen's *t*-tests (see Footnote 13).

2.3.2.2.1 Participant Attrition

Ninety-three participants ($n_{\text{Experimental}} = 45$) provided responses to the T1 assessment. Of these 93, 64 ($n_{\text{Experimental}} = 25$) responded to the T2 assessment, resulting in an overall attrition rate of 31.18% between the first two time periods. Chi-square and independent *t*-tests indicated that attrition was significantly related to condition and age; $\chi^2(1, N = 93) = 7.15$, $p = .01$, $V = .28$ and $t(91) = -2.05$, $p = .04$, $d = -.50$, respectively. More specifically, the rate of attrition was higher in the experimental condition (44.44%) than in the waitlist control condition (18.75%) and participants who did not respond to the T2 survey ($M = 44.28$, $SD = 8.03$) were found to be younger than those who did ($M = 48.61$, $SD = 9.99$). Attrition was not found to be affected by gender, job position, size of one's home office, length of time spent working in one's current position, number of hours per week spent working, or length of previous meditation experience; $\chi^2(1, N = 93) = .42$, $p = .52$, $V = .07$; $\chi^2_{\text{lr}}(4, N = 93) = 4.21$, $p = .38$, $V = .20$; $\chi^2_{\text{lr}}(2, N = 93) = .65$, $p = .72$, $V = .09$; $z = -.96$, $p = .34$, $r = .10$; $z = .45$, $p = .65$, $r = .05$; and $z = .19$, $p = .85$, $r = .02$, respectively.

2.3.2.2.2 Modified Intention-to-Treat Analyses

For the mITT analyses, $n = 64$ ($n_{\text{Experimental}} = 25$); characteristics of these 64 participants are presented in Table 2.9. None of the characteristics differed significantly across conditions among these participants; gender, $\chi^2(1, N = 64) = 1.68$, $p = .19$, $V = .16$; job position, $\chi^2_{\text{lr}}(4, N = 64) = 3.18$, $p = .53$, $V = .20$; size of home office, $\chi^2_{\text{lr}}(2, N = 64) = 3.86$, $p = .14$, $V = .22$; age, $t(62) = -.61$, $p = .55$, $d = -.16$; length of time spent working in one's current position, $z = -1.67$, $p = .10$, $r = .21$; hours per week spent working, $z = .80$, $p = .43$, $r = .10$; and years of previous meditation experience, $z = -.60$, $p = .55$, $r = .08$. Visualizations of

Table 2.9. The Mindful Lawyer Study 2 — Modified Intention-to-Treat Time 2 Comparisons: Participant characteristics.

	Control			Experimental			Overall		
Characteristic	n	M	SD	n	M	SD	n	M	SD
Age (Years)	39	48.00	10.28	25	49.56	9.64	64	48.61	9.99
Years in Current Position	39	9.55	9.20	23	12.41	8.42	62	10.61	8.96
Hrs/Week Worked	39	50.86	10.74	25	49.72	8.33	64	50.41	9.82
Previous Meditation Experience (Years)	37[a]	.67	2.03	25	1.72	4.40	62	1.09	3.21
Meditation During the Program (Mins/Week)		N/A		25	35.58	19.03			
Gender									
Male	11			11			22		
Female	28			14			42		
Position									
Equity Shareholder	9			7			16		
Non-Equity Shareholder	12			10			22		
Of Counsel/Counsel	6			4			10		
Associate	10			4			14		
Other	2			0			2		
Size of Home Office									
< 10 Employees	0			2			2		
10 – 20 Employees	7			4			11		
> 20 Employees	32			19			51		

[a]Two control participants have been excluded because they indicated that they had 3+ years of meditation experience but failed to further specify the number of years of experience that they possessed.

the ANCOVAs and Yuen's *t*-tests that were performed in this section are presented in figures 2.3 and 2.4, respectively. Descriptive statistics from each test are displayed in tables 2.10 and 2.11. Scales generally displayed adequate levels of internal consistency (i.e., $\alpha \geq .70$; see Table 2.12), though Cronbach's alpha was found to be low at T2 on the anxiety subscale of the DASS-21 among experimental participants.

2.3.2.2.2.1 Perceived Stress Scale

After adjusting for differences in T1 scores, participants in the experimental condition were found to have significantly lower T2 scores on the PSS than participants in the control condition; $F(1, 61) = 11.65$, $p = .001$, $\eta_G^2 = .16$.

2.3.2.2.2.2 Positive and Negative Affect Schedule

After adjusting for differences in T1 scores, participants in the experimental condition were found to have significantly higher T2 scores on the positive affect subscale and significantly lower T2 scores on the negative affect subscale of the PANAS than participants in the control condition; $F(1, 61) = 5.82$, $p = .02$, $\eta_G^2 = .09$ and $F(1, 61) = 9.04$, $p = .004$, $\eta_G^2 = .13$, respectively.

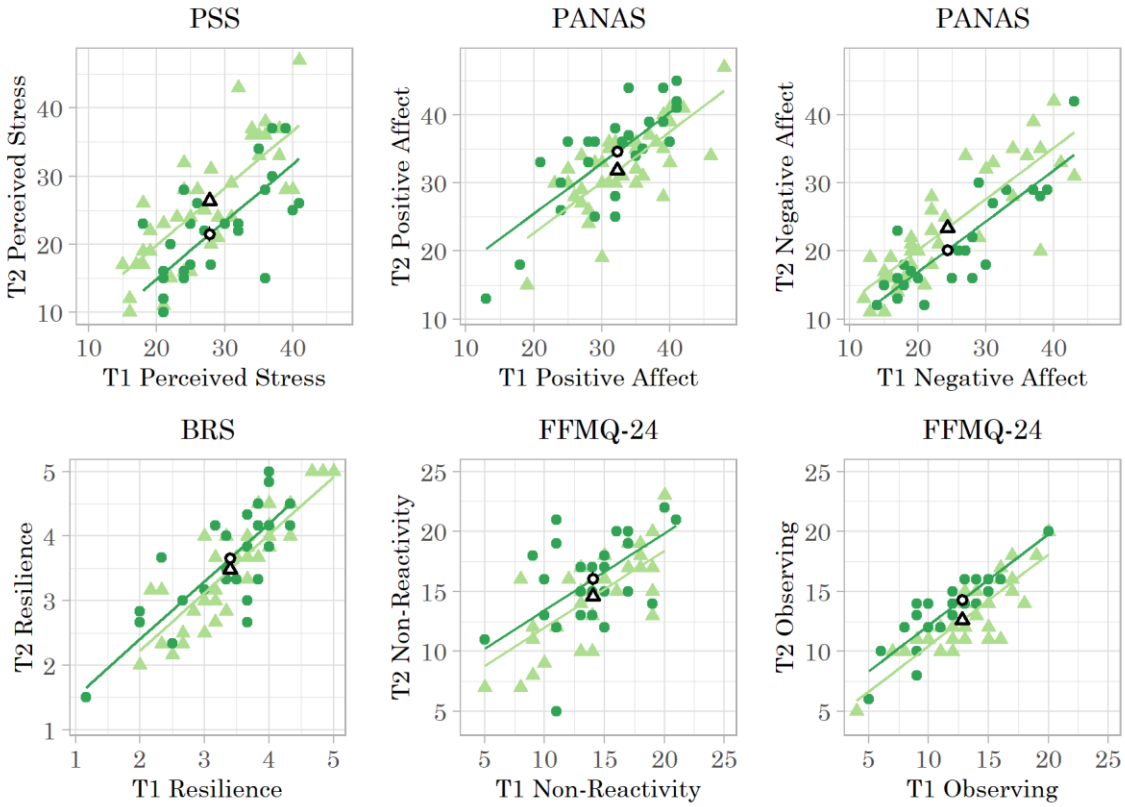
2.3.2.2.2.3 Brief Resilience Scale

After adjusting for differences in T1 scores, no T2 differences were observed between conditions on the BRS; $F(1, 61) = 2.19$, $p = .14$, $\eta_G^2 = .04$.

2.3.2.2.2.4 Five Facet Mindfulness Questionnaire-24

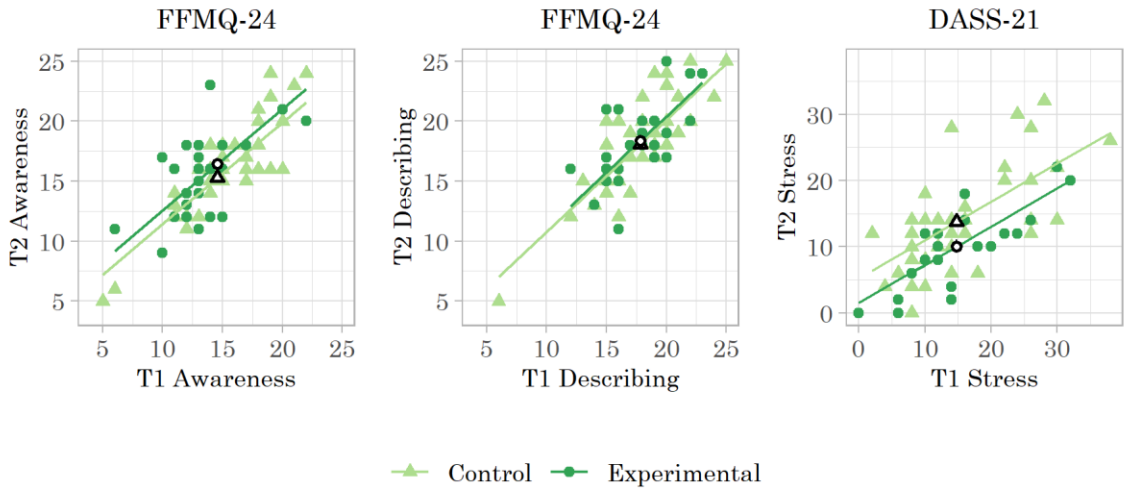
After adjusting for differences in T1 scores, participants in the experimental condition were found to have significantly higher T2 scores on the observing subscale of the FFMQ-24 than participants in the control condition; $F(1, 61) = 18.26$, $p < .001$, $\eta_G^2 = .23$. T2 differences were not observed between conditions on the non-reactivity, awareness, or describing subscales; $F(1, 61) = 3.81$, $p = .06$, $\eta_G^2 = .06$; $F(1, 61) = 3.05$, $p = .09$, $\eta_G^2 = .05$; and $F(1, 61) = .23$, $p = .64$, $\eta_G^2 =$

Figure 2.3. The Mindful Lawyer Study 2 — Modified Intention-to-Treat Time 2 Comparisons: Visual depictions of analysis of covariance tests.



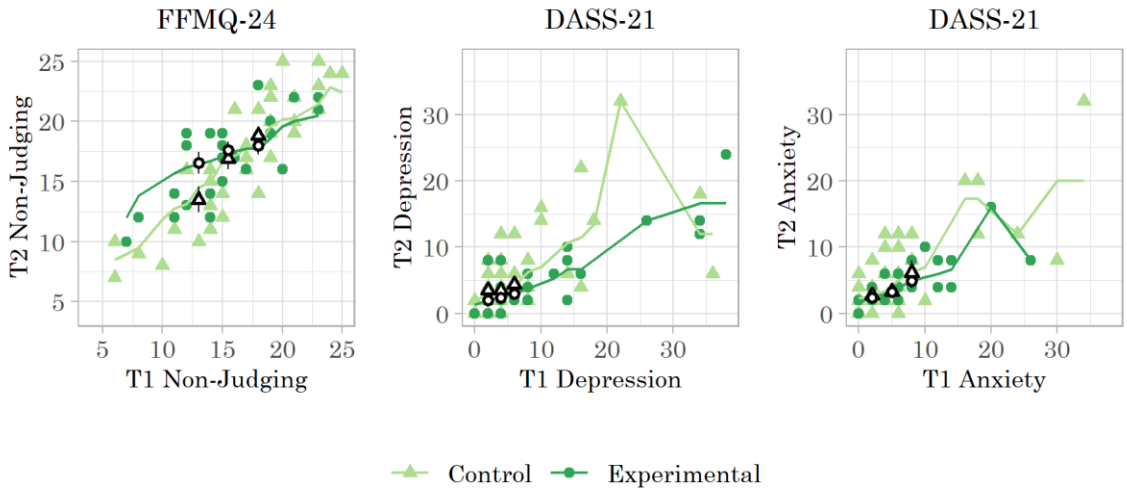
(Continued on the next page.)

(Figure 2.3 continued.)



Note. Plots depict Time 2 (T2) scores as a function of both Time 1 (T1) scores and condition (control = light green/grey triangles; experimental = dark green/grey circles). Regression lines illustrate the models used to test for condition-specific differences in T2 scores on the Perceived Stress Scale (PSS); the positive and negative affect subscales of the Positive and Negative Affect Schedule (PANAS); the Brief Resilience Scale (BRS); the non-reactivity, observing, awareness, and describing subscales of the Five Facet Mindfulness Questionnaire-24 (FFMQ-24); and the stress subscale of the Depression Anxiety Stress Scales-21 (DASS-21). Open triangles and circles represent adjusted means for the control and experimental conditions, respectively. Whiskers representing the standard errors of the adjusted means are also plotted but are too small to be visible.

Figure 2.4. The Mindful Lawyer Study 2 — Modified Intention-to-Treat Time 2 Comparisons: Visual depictions of Yuen's tests.



Note. Plots depict Time 2 (T2) scores as a function of both Time 1 (T1) scores and condition (control = light green/grey triangles; experimental = dark green/grey circles). Nonparametric regression lines illustrate the results of running interval trimmed mean smoothing functions that have been applied to scores on the non-judging subscale of the Five Facet Mindfulness Questionnaire-24 (FFMQ-24) and the depression and anxiety subscales of the Depression Anxiety Stress Scales-21 (DASS-21). Open triangles and circles represent the comparison points (i.e., trimmed means of the control and experimental conditions, respectively) used to test for condition-specific differences in T2 scores at certain levels of T1; whiskers represent standard errors of the trimmed means.

Table 2.10. The Mindful Lawyer Study 2 — Modified Intention-to-Treat Time 2 Comparisons: Time 1 grand means and Time 2 adjusted means and standard errors for measures analyzed via analysis of covariance tests.

		Control	Experimental
Measure	Time 1 (M_G)	Time 2 ($M_{adj} \pm SE$)	Time 2 ($M_{adj} \pm SE$)
Perceived Stress Scale*			
	27.77	26.40 ± .90	21.46 ± 1.13
Positive and Negative Affect Schedule			
Positive Affect*	32.30	31.85 ± .72	34.63 ± .90
Negative Affect*	24.36	23.43 ± .68	20.17 ± .85
Brief Resilience Scale			
	3.40	3.48 ± .07	3.66 ± .09
Five Facet Mindfulness Questionnaire-24			
Non-Reactivity	14.05	14.61 ± .46	16.05 ± .58
Observing*	12.81	12.61 ± .25	14.32 ± .31
Awareness	14.58	15.29 ± .40	16.43 ± .50
Describing	17.83	18.09 ± .38	18.38 ± .48
Depression Anxiety Stress Scales-21			
Stress*	14.81	13.80 ± .83	10.07 ± 1.04

*$p \leq .05$.

Table 2.11. The Mindful Lawyer Study 2 — Modified Intention-to-Treat Time 2 Comparisons: Time 1 comparison points and Time 2 trimmed means and standard errors for measures analyzed via Yuen's tests.

		Control	Experimental
Measure	Time 1	Time 2 ($M_t \pm SE$)	Time 2 ($M_t \pm SE$)
Five Facet Mindfulness Questionnaire-24			
Non-Judging	13.00	13.50 ± 1.08	16.56 ± .92
	15.50	16.94 ± .90	17.64 ± .67
	18.00	18.85 ± .76	18.00 ± .73
Depression Anxiety Stress Scales-21			
Depression	2.00	3.50 ± .78	2.00 ± .84
	4.00	3.56 ± .55	2.40 ± .74
	6.00	4.42 ± .78	3.00 ± .97
Anxiety	2.00	2.74 ± .75	2.44 ± .42
	5.00	3.33 ± .90	3.23 ± .67
	8.00	6.20 ± 1.79	4.89 ± 1.04

Table 2.12. The Mindful Lawyer Study 2 — Modified Intention-to-Treat Time 2 Comparisons: Internal consistency (α) of the scales used.

	Control Condition			Experimental Condition			Conditions Combined		
Measure	Time 1	Time 2	Overall	Time 1	Time 2	Overall	Time 1	Time 2	Overall
Perceived Stress Scale									
	.90	.92	.91	.89	.91	.92	.89	.92	.91
Positive and Negative Affect Schedule									
Positive Affect	.89	.88	.89	.93	.94	.94	.91	.91	.91
Negative Affect	.90	.90	.90	.91	.92	.92	.90	.91	.91
Brief Resilience Scale									
	.88	.93	.90	.91	.88	.89	.89	.91	.90
Five Facet Mindfulness Questionnaire-24									
Non-Reactivity	.86	.87	.86	.84	.87	.87	.85	.87	.87
Observing	.83	.82	.83	.85	.80	.84	.85	.81	.83
Awareness	.87	.89	.88	.80	.82	.82	.86	.87	.86
Describing	.86	.93	.90	.73	.89	.82	.82	.92	.88
Non-Judging	.92	.93	.93	.86	.81	.85	.90	.91	.90
Depression Anxiety Stress Scales-21									
Depression	.92	.87	.90	.94	.85	.92	.93	.86	.91
Anxiety	.88	.80	.84	.73	.64	.72	.84	.77	.81
Stress	.88	.88	.88	.85	.84	.86	.86	.87	.87

.004, respectively. A non-parametric approach was used to assess T2 differences on the non-judging subscale because regression slopes were found to be heterogeneous. Trimmed means were compared at T1 = 13.00, 15.50, and 18.00. No significant condition-specific differences were observed between T2 non-judging scores at any of the T1 values considered; at 13.00, $t_Y(14.79) = 2.24$, $p_{adj} = .12$, $\xi = .54$; at 15.50, $t_Y(24.93) = .68$, $p_{adj} = .80$, $\xi = .18$; and at 18.00, $t_Y(19.93) = .86$, $p_{adj} = .80$, $\xi = .21$.

2.3.2.2.2.5 Depression Anxiety Stress Scales-21

The spread of participants across each of the DASS-21 severity categories is outlined in Table 2.13. At T1, both conditions reported anxiety and stress symptoms of above-normal severity at higher rates than in Krill et al. (2016; see Table 2.6); participants in the experimental condition also reported higher rates of above-normal depression symptoms. Between condition comparisons further suggest that the experimental condition began the study with more severe levels of depression, anxiety, and stress than the waitlist control condition. However, symptom severity seems to have declined over time among experimental participants and, by T2, larger proportions of the experimental condition fell within the normal range on each of the three subscales than did the control condition. Compared to the participants from Krill et al. (2016), participants in the experimental condition additionally reported less severe levels of stress at T2 and both conditions reported less severe levels of T2 depression.

After adjusting for differences in T1 scores, participants in the experimental condition were found to have significantly lower T2 scores on the stress subscale of the DASS-21 than participants in the control condition; $F(1, 61) = 7.94$, $p = .01$, $\eta_G^2 = .12$. A non-parametric approach was used to assess T2 differences on the depression and anxiety subscales because the residuals for both were found to be heteroscedastic. For the depression subscale, trimmed

Table 2.13. The Mindful Lawyer Study 2 — Modified Intention-to-Treat Time 2 Comparisons: Percentage of participant responses on the Depression Anxiety Stress Scales-21 that fall in each of the symptom severity categories.

	Depression		Anxiety		Stress	
Symptom Severity	Time 1	Time 2	Time 1	Time 2	Time 1	Time 2
Control Condition[a]						
Normal	76.92	79.49	74.36	64.10	61.54	71.79
Mild	5.13	5.13	7.69	7.69	10.26	5.13
Moderate	10.26	10.26	2.56	20.51	7.69	10.26
Severe	2.56	2.56	7.69	.00	17.95	12.82
Extremely Severe	5.13	2.56	7.69	7.69	2.56	.00
Experimental Condition[b]						
Normal	64.00	80.00	60.00	76.00	60.00	84.00
Mild	4.00	8.00	12.00	16.00	16.00	8.00
Moderate	16.00	8.00	20.00	4.00	12.00	8.00
Severe	4.00	4.00	.00	4.00	12.00	.00
Extremely Severe	12.00	.00	8.00	.00	.00	.00

[a]$n = 39$. [b]$n = 25$.

means were compared at T1 = 2.00, 4.00, and 6.00. No significant condition-specific differences were observed between T2 depression scores at any of the T1 values considered; at 2.00, $t_Y(21.32) = 1.40$, $p_{adj} = .53$, $\xi = .29$; at 4.00, $t_Y(19.18) = 1.27$, $p_{adj} = .53$, $\xi = .24$; and at 6.00, $t_Y(21.52) = 1.29$, $p_{adj} = .53$, $\xi = .30$. For the anxiety subscale, trimmed means were compared at T1 = 2.00, 5.00, and 8.00. No significant condition-specific differences were observed between T2 anxiety scores at any of the T1 values considered; at 2.00, $t_Y(25.90) = .36$, $p_{adj} = 1.00$, $\xi = .13$; at 5.00, $t_Y(31.62) = .10$, $p_{adj} = 1.00$, $\xi = .12$; and at 8.00, $t_Y(13.50) = .66$, $p_{adj} = 1.00$, $\xi = .22$.

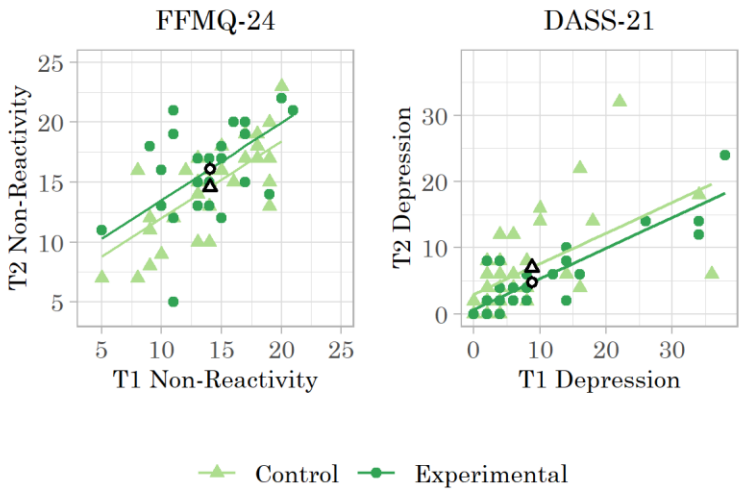
2.3.2.2.3 Per-Protocol Analyses

Of the 64 participants who responded to both the T1 and T2 assessments, one in the experimental condition indicated that they did not meditate at all throughout the program. For PP analyses, therefore, $n = 63$ ($n_{Experimental} = 24$). PP analyses deviated from mITT analyses with respect to the non-reactivity and non-judging subscales of the FFMQ-24 and the depression subscale of the DASS-21 (see figures 2.5 and 2.6). All other results from PP analyses were found to be comparable to the results from mITT analyses.

2.3.2.2.3.1 Five Facet Mindfulness Questionnaire-24

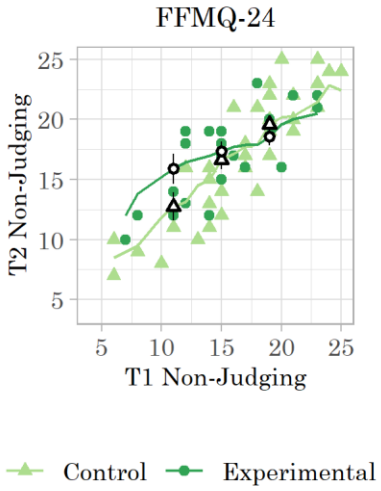
Whereas mITT analyses found no T2 differences on the non-reactivity subscale of the FFMQ-24, PP analyses found that, after adjusting for differences in T1 scores ($M_G = 14.03$), participants in the experimental condition ($M_{adj} = 16.11$, $SE = .59$) had significantly higher T2 scores than participants in the control condition ($M_{adj} = 14.60$, $SE = .47$); $F(1, 60) = 4.04$, $p = .05$, $\eta^2_G = .06$. With respect to the non-judging subscale, mITT analyses compared T2 scores at T1 = 13.00, 15.50, and 18.00. PP comparisons, however, were made at T1 = 11.00 (control, $M_t = 12.75$, $SE = 1.19$; experimental, $M_t = 15.89$, $SE = 1.28$), 15.00 (control, $M_t = 16.67$, $SE = .79$;

Figure 2.5. The Mindful Lawyer Study 2 — Per-Protocol Time 2 Comparisons: Visual depictions of analysis of covariance tests.



Note. Plots depict Time 2 (T2) scores as a function of both Time 1 (T1) scores and condition (control = light green/grey triangles; experimental = dark green/grey circles). Regression lines illustrate the models used to test for condition-specific differences in T2 scores on the non-reactivity subscale of the Five Facet Mindfulness Questionnaire-24 (FFMQ-24) and the depression subscale of the Depression Anxiety Stress Scales-21 (DASS-21). Open triangles and circles represent adjusted means for the control and experimental conditions, respectively. Whiskers representing the standard errors of the adjusted means are also plotted but are too small to be visible.

Figure 2.6. The Mindful Lawyer Study 2 — Per-Protocol Time 2 Comparisons: Visual depiction of Yuen's test.



Note. Plot depicts Time 2 (T2) scores as a function of both Time 1(T1) scores and condition (control = light green/grey triangles; experimental = dark green/grey circles). Nonparametric regression lines illustrate the results of running interval trimmed mean smoothing functions that have been applied to scores on the non-judging subscale of the Five Facet Mindfulness Questionnaire-24 (FFMQ-24). Open triangles and circles represent the comparison points (i.e., trimmed means of the control and experimental conditions, respectively) used to test for condition-specific differences in T2 scores at certain levels of T1; whiskers represent standard errors of the trimmed means.

experimental, M_t = 17.33, SE = .80), and 19.00 (control, M_t = 19.60, SE = .70; experimental, M_t = 18.56, SE = .74). Ultimately though, PP results were similar to mITT results in that there were no differences in T2 non-judging scores at any of the T1 values considered; at 11.00, $t_Y(14.84) = 1.84$, $p_{adj} = .09$, $\xi = .26$; at 15.00, $t_Y(24.97) = .61$, $p_{adj} = .54$, $\xi = .65$; and at 19.00, $t_Y(19.67) = 1.01$, $p_{adj} = .33$, $\xi = .65$.

2.3.2.2.3.2 Depression Anxiety Stress Scales-21

Due to heteroscedasticity, mITT analyses employed a non-parametric approach to assess T2 differences on the depression subscale of the DASS-21. In PP analyses, a standard ANCOVA was used because depression subscale residuals were homoscedastic. Ultimately though, PP results were similar to mITT results in that T2 differences in scores on the depression subscale were not observed between conditions (M_G = 8.83; control, M_{adj} = 7.06, SE = .77; experimental, M_{adj} = 4.78, SE = .98); $F(1, 60) = 3.27$, $p = .08$, $\eta^2_G = .05$.

2.3.2.3 Time 2 and 3 Comparisons

Pre- to post-intervention changes were assessed for those in the waitlist control condition via paired samples t-tests or, in cases of non-normality, Wilcoxon signed-rank tests. Though T2 and T3 data was also collected from participants in the experimental condition, some experimental participants continued to meditate throughout this time period and those who did not may have been influenced by long-term carry-over effects from the program; this data, therefore, is unsuitable for use as a control in these tests. As a result, only changes in the control condition are assessed in these analyses and the results in this section should be interpreted with caution due to the lack of a comparison group.

2.3.2.3.1 Participant Attrition

Forty waitlist control participants provided responses to the T2 assessment. Of these 40, 21 responded to the T3 assessment, resulting in an attrition rate of 47.50%. Attrition was not found to be affected by gender, job position, size of one's home office, age, length of time spent working in one's current position, number of hours per week spent working, or length of previous meditation experience; $\chi^2(1, N = 40) = .23$, $p = .63$, $V = .08$; $\chi^2_{lr}(4, N = 40) = 6.16$, $p = .19$, $V = .36$; $\chi^2_{lr}(1, N = 40) = 1.99$, $p = .16$, $V = .22$; $t(38) = -.53$, $p = .60$, $d = -.17$; $z = .94$, $p = .36$, $r = .15$; $z = .34$, $p = .74$, $r = .05$; and $z = 1.05$, $p = .31$, $r = .17$, respectively.

2.3.2.3.2 Modified Intention-to-Treat Analyses

One participant was omitted from analyses involving the FFMQ-24 and the DASS-21 because they failed to respond to these scales in the T3 assessment. Consequently, $n = 21$ or 20 for the mITT analyses; characteristics of these participants are presented in Table 2.14. Score distributions are presented in Figure 2.7 and descriptive statistics for each outcome measure are displayed in Table 2.15. All scales displayed adequate levels of internal consistency (i.e., $\alpha \geq .70$; see Table 2.16).

2.3.2.3.2.1 Perceived Stress Scale

Analyses revealed a significant T2 to T3 decrease in control scores on the PSS; $t(20) = 2.30$, $p = .03$, $d = .50$.

2.3.2.3.2.2 Positive and Negative Affect Schedule

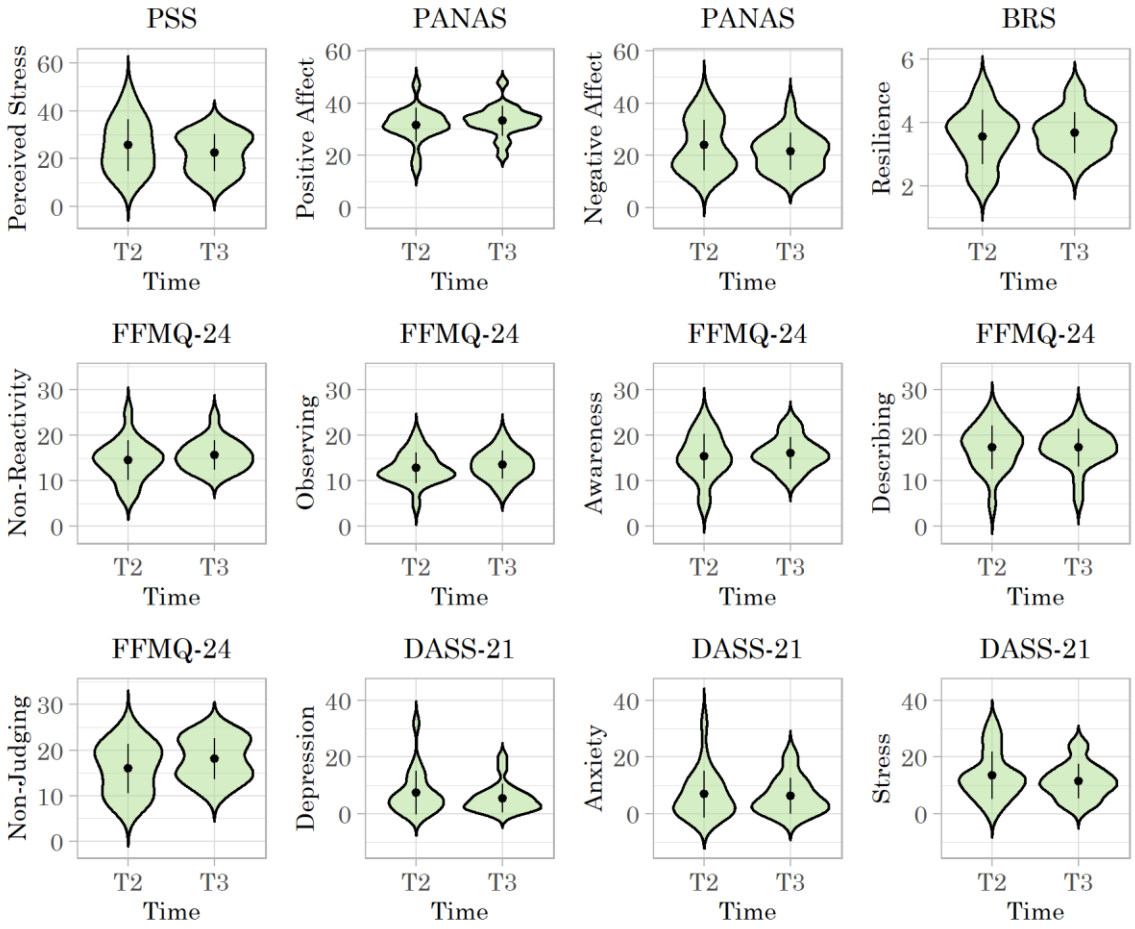
Analyses revealed a significant T2 to T3 decrease in control scores on the negative affect subscale of the PANAS; $z = 2.23$, $p = .02$, $r = .49$. Control scores on the positive affect subscale did not significantly change from T2 to T3; $z = -1.66$, $p = .10$, $r = .36$.

Table 2.14. The Mindful Lawyer Study 2 — Modified Intention-to-Treat Time 2 and 3 Comparisons: Control participant characteristics.

Characteristic	*n*	*M*	*SD*
Age (Years)	21	48.52	11.08
Years in Current Position	21	8.69	9.67
Hrs/Week Worked	21	51.71	8.50
Previous Meditation Experience (Years)[a]	19	.20	.47
Meditation During the Program (Mins/Week)	21	40.95	44.76
Gender			
Male	7		
Female	14		
Position			
Equity Shareholder	4		
Non-Equity Shareholder	5		
Of Counsel/Counsel	2		
Associate	8		
Other	2		
Size of Home Office			
10 – 20 Employees	2		
> 20 Employees	19		

[a]Two participants have been excluded because they indicated that they had 3+ years of meditation experience but failed to further specify the number of years of experience that they possessed.

Figure 2.7. The Mindful Lawyer Study 2 — Modified Intention-to-Treat Time 2 and 3 Comparisons: Distributions of control participant scores on each of the outcome measures.



Note. Score distributions are shown for the Perceived Stress Scale (PSS); the positive and negative affect subscales of the Positive and Negative Affect Schedule (PANAS); the Brief Resilience Scale (BRS); the non-reactivity, observing, awareness, describing, and non-judging subscales of the Five Facet Mindfulness Questionnaire-24 (FFMQ-24); and the depression, anxiety, and stress subscales of the Depression Anxiety Stress Scales-21 (DASS-21). Scores are depicted at Time 2 (T2) and Time 3 (T3). Dots and whiskers represent means and standard deviations, respectively.

Table 2.15. The Mindful Lawyer Study 2 — Modified Intention-to-Treat Time 2 and 3 Comparisons: Control means and standard deviations for each measure.

Measure	Time 2 ($M \pm SD$)	Time 3 ($M \pm SD$)
Perceived Stress Scale*		
	25.67 ± 10.77	22.57 ± 7.82
Positive and Negative Affect Schedule		
Positive Affect	31.62 ± 6.51	33.24 ± 5.79
Negative Affect*	23.86 ± 9.71	21.43 ± 7.11
Brief Resilience Scale		
	3.55 ± .86	3.67 ± .66
Five Facet Mindfulness Questionnaire-24		
Non-Reactivity	14.50 ± 4.32	15.65 ± 3.23
Observing	12.80 ± 3.33	13.50 ± 3.12
Awareness	15.35 ± 4.89	16.05 ± 3.46
Describing	17.30 ± 4.76	17.25 ± 4.17
Non-Judging*	15.95 ± 5.45	18.05 ± 4.49
Depression Anxiety Stress Scales-21		
Depression	7.40 ± 7.68	5.50 ± 5.10
Anxiety	6.90 ± 8.25	6.30 ± 6.23
Stress	13.50 ± 8.41	11.50 ± 6.12

*$p \leq .05$.

Table 2.16. The Mindful Lawyer Study 2 — Modified Intention-to-Treat Time 2 and 3 Comparisons: Internal consistency (α) of the scales used.

Measure	Time 2	Time 3	Overall
Perceived Stress Scale			
	.95	.92	.94
Positive and Negative Affect Schedule			
Positive Affect	.93	.92	.93
Negative Affect	.93	.94	.93
Brief Resilience Scale			
	.95	.90	.94
Five Facet Mindfulness Questionnaire-24			
Non-Reactivity	.91	.84	.88
Observing	.86	.90	.88
Awareness	.91	.86	.89
Describing	.95	.96	.95
Non-Judging	.92	.93	.92
Depression Anxiety Stress Scales-21			
Depression	.88	.82	.86
Anxiety	.87	.86	.87
Stress	.89	.83	.87

2.3.2.3.2.3 Brief Resilience Scale

Analyses revealed that control scores on the BRS did not significantly change from T2 to T3; $t(20) = -1.12$, $p = .28$, $d = -.24$.

2.3.2.3.2.4 Five Facet Mindfulness Questionnaire-24

Analyses revealed a significant T2 to T3 increase in control scores on the non-judging subscale of the FFMQ-24; $t(19) = -2.43$, $p = .03$, $d = -.54$. Control scores on the non-reactivity, observing, awareness, and describing subscales did not significantly change from T2 to T3; $t(19) = -1.99$, $p = .06$, $d = -.45$; $t(19) = -1.08$, $p = .29$, $d = -.24$; $t(19) = -.87$, $p = .40$, $d = -.19$; and $t(19) = .08$, $p = .94$, $d = .02$, respectively.

2.3.2.3.2.5 Depression Anxiety Stress Scales-21

The spread of waitlist control participants across each of the DASS-21 severity categories is outlined in Table 2.17. Prior to the intervention, participants reported symptoms of above-normal severity at higher rates than in Krill et al. (2016; see Table 2.6). Waitlist control participants also began the program with more severe levels of anxiety than the experimental group did (see Table 2.9). Post-intervention rates of above-normal anxiety and stress remained higher in the control group than in the sample from Krill et al. (2016) and improvements on these measures do not seem to have been as large as they were in the experimental group. Nevertheless, symptom severity appears to have decreased over time, with T2 to T3 increases in the percentage of waitlist control participants falling into the normal category on all three of the subscales. Analyses suggest, however, that these decreases were not particularly notable, as none of the T2 to T3 changes on the DASS-21 were found to be significant; depression, $z = 1.33$, $p = .19$, $r = .30$; anxiety, $z = .00$, $p = 1.00$, $r = .00$; and stress, $t(19) = 1.45$, $p = .16$, $d = .32$.

Table 2.17. The Mindful Lawyer Study 2 — Modified Intention-to-Treat Time 2 and 3 Comparisons: Percentage of control participant responses on the Depression Anxiety Stress Scales-21 that fall in each of the symptom severity categories.

	Depression		Anxiety		Stress	
Symptom Severity	T2[a]	T3[b]	T2[a]	T3[b]	T2[a]	T3[b]
Normal	71.43	85.00	57.14	65.00	71.43	75.00
Mild	4.76	5.00	4.76	5.00	.00	15.00
Moderate	19.05	10.00	23.81	20.00	14.29	10.00
Severe	.00	.00	.00	.00	14.29	.00
Extremely Severe	4.76	.00	14.29	10.00	.00	.00

Note. T2 = Time 2 and T3 = Time 3. [a]n = 21. [b]n = 20.

2.3.2.3.3 Per-Protocol Analyses

All of the 21 waitlist control participants who responded to both the T2 and T3 assessments indicated that they meditated throughout the program. PP analyses are, therefore, identical to mITT analyses.

2.3.2.4 Moderation of Change Over Time

Exploratory analyses were conducted to determine whether the change in each outcome measure was moderated by length of previous meditation experience or amount of program participation (see Section 2.2.2.2 for an explanation of this process). These analyses included the experimental participants from the T2 comparison analyses (i.e., Section 2.3.2.2) and the waitlist control participants from the T2 and T3 comparison analyses (i.e., Section 2.3.2.3).[24] For each outcome measure, change over time was calculated as post-intervention scores – pre-intervention scores (i.e., for experimental participants, T2 – T1 and, for control participants, T3 – T2). The individual moderating effects of experience and participation were then assessed for each measure with separate regression analyses.

2.3.2.4.1 Modified Intention-to-Treat Analyses

Regression results are presented in Tables 2.18 and 2.19. Intervention participation was found to be a significant moderator of change in scores on both the PSS and the non-judging subscale of the FFMQ-24 (see Figure 2.8). In general, more time spent meditating was found to be associated with more negative change (i.e., greater decreases) in perceived stress and more positive

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[24]One waitlist control participant was omitted from analyses involving the FFMQ-24 and the DASS-21 because they failed to respond to these scales in the T3 assessment. Two waitlist control participants were further excluded from analyses regarding experience because they failed to specify the amount of meditation experience that they possessed.

Table 2.18. The Mindful Lawyer Study 2 — Modified Intention-to-Treat Moderations: Change over time moderated by years of previous meditation experience.

	All Participants				Outliers Removed			
Measure	R^2	*F*	*p*	*B*	R^2	*F*	*p*	*B*
Perceived Stress Scale[a]								
	.02	.84	.36	-.26	.003	.11	.75	-4.30
Positive and Negative Affect Schedule[a]								
Positive Affect	.04	1.86	.18	.29	< .001	.03	.86	1.73
Negative Affect	.03	1.24	.27	.23	< .001	.02	.88	1.24
Brief Resilience Scale[a]								
	.02	.86	.36	-.02	.02	.78	.38	-.90
Five Facet Mindfulness Questionnaire-24[b]								
Non-Reactivity	.01	.36	.55	-.09	< .001	.02	.89	-.99
Observing	.02	.85	.36	.10	< .001	< .001	.98	-.15
Awareness	.002	.09	.77	-.04	< .001	.02	.89	.95
Describing	.01	.26	.61	-.07	.001	.04	.85	-1.08
Non-Judging	.03	1.08	.31	-.15	.01	.16	.69	2.58
Depression Anxiety Stress Scales-21[b]								
Depression	.02	.66	.42	.25	.04	1.28	.27	-15.33
Anxiety	.01	.28	.60	.15	< .001	< .001	.98	-.28
Stress	.001	.05	.83	-.06	.001	.03	.86	-2.08

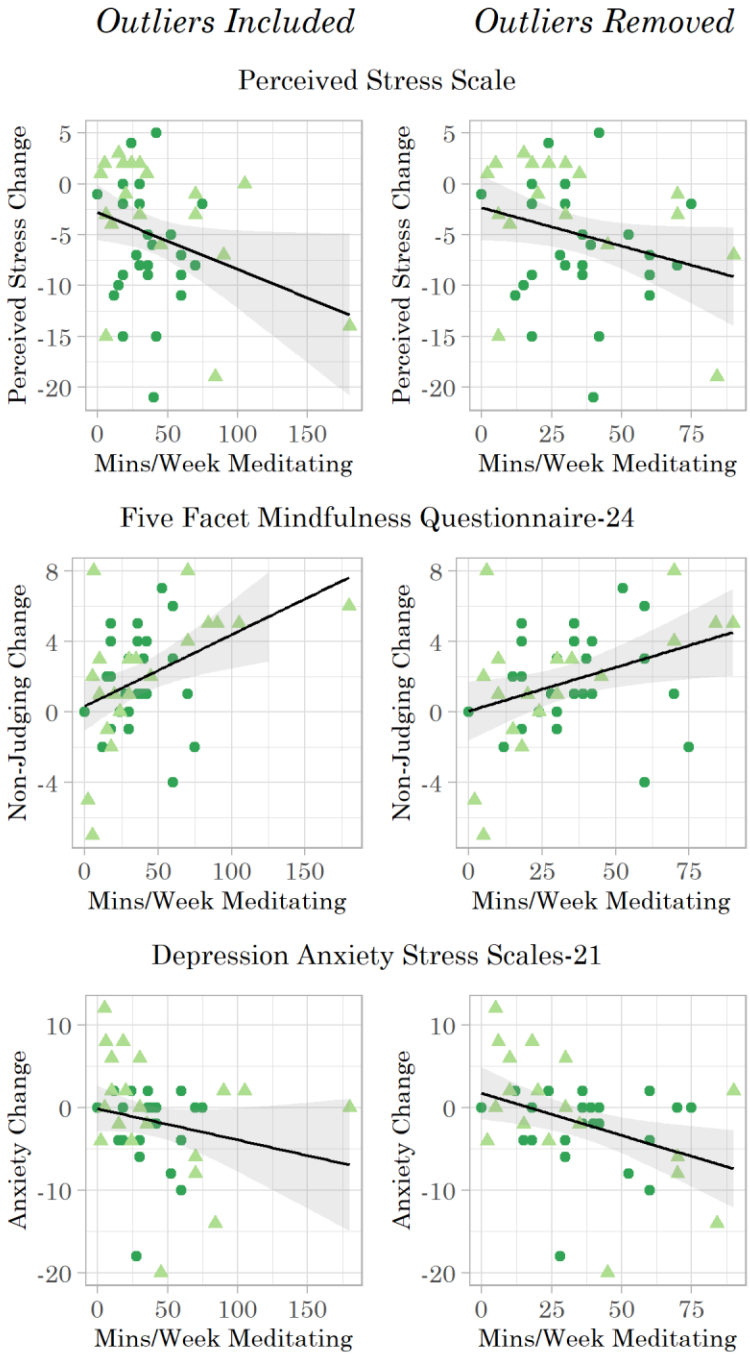
Note. Experimental change was calculated as Time 2 – Time 1. Control change was calculated as Time 3 – Time 2. [a]When all participants were included, $df = 1, 42$; after outlier removal, $df = 1, 32$. [b]When all participants were included, $df = 1, 41$; after outlier removal, $df = 1, 32$.

Table 2.19. The Mindful Lawyer Study 2 — Modified Intention-to-Treat Moderations: Change over time moderated by minutes per week spent meditating during the program.

	All Participants				Outliers Removed			
Measure	R^2	*F*	*p*	*B*	R^2	*F*	*p*	*B*
Perceived Stress Scale[a]								
	.09	4.24	.05*	-.06	.08	3.72	.06	-.08
Positive and Negative Affect Schedule[a]								
Positive Affect	.01	.63	.43	.02	.01	.44	.51	.02
Negative Affect	.04	1.94	.17	-.03	.03	1.26	.27	-.03
Brief Resilience Scale[a]								
	.04	1.65	.21	-.003	.01	.40	.53	.002
Five Facet Mindfulness Questionnaire-24[b]								
Non-Reactivity	.002	.07	.80	-.004	< .001	.03	.85	.004
Observing	.02	.92	.34	.01	.06	2.49	.12	.02
Awareness	< .001	.02	.88	.002	.02	.71	.40	.02
Describing	.01	.59	.45	.01	.04	1.58	.22	.02
Non-Judging	.17	8.92	.005*	.04	.13	6.10	.02*	.05
Depression Anxiety Stress Scales-21[b]								
Depression	.05	2.17	.15	-.04	.07	3.09	.09	-.08
Anxiety	.04	1.91	.17	-.04	.15	7.05	.01*	-.10
Stress	.03	1.33	.26	-.03	.20	10.27	.003*	-.11

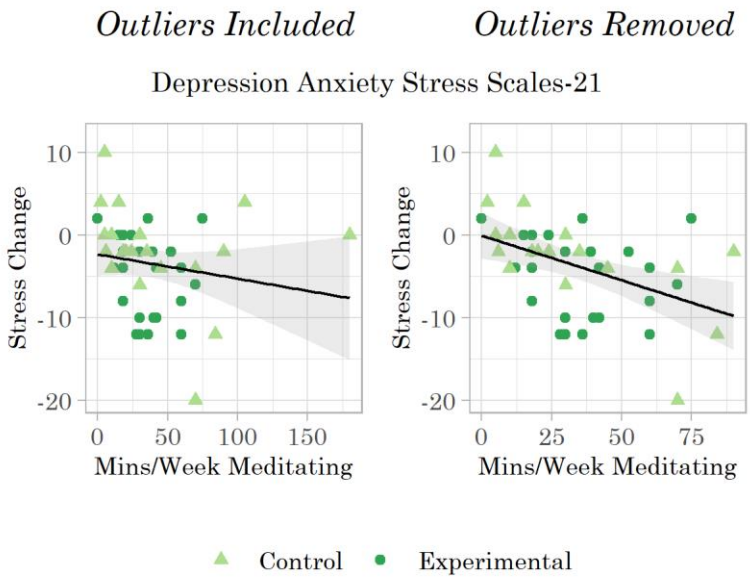
Note. Experimental change was calculated as Time 2 – Time 1. Control change was calculated as Time 3 – Time 2. [a]When all participants were included, $df = 1, 44$; after outlier removal, $df = 1, 42$. [b]When all participants were included, $df = 1, 43$; after outlier removal, $df = 1, 41$. $^*p \leq .05$.

Figure 2.8. The Mindful Lawyer Study 2 — Modified Intention-to-Treat Moderations: Changes in perceived stress, non-judging, anxiety severity, and stress severity as a function of time spent meditating during the intervention.



(Continued on the next page.)

(Figure 2.8 continued.)



Note. Figures depict the moderating relationship between minutes per week spent meditating during the intervention and changes in scores on the Perceived Stress Scale, the non-judging subscale of the Five Facet Mindfulness Questionnaire-24, and the anxiety and stress subscales of the Depression Anxiety Stress Scales-21 both before (left) and after (right) outlier removal. For participants in the control condition (light green/grey triangles), change was calculated as T3 – T2. For participants in the experimental condition (dark green/grey circles), change was calculated as T2 – T1. The shaded area represents a 95% confidence region.

change (i.e., larger increases) in non-judging over time. Note, however, that these relationships appear to be driven largely by two participants who reported meditating for 105.00 and 180.00 minutes per week. Using a standard cut-off of 1.5 × the interquartile range, these responses were identified as outliers in the sample, as were ten experience values ranging from .75 to 20.00 years of meditation experience. The removal of outlier responses ultimately rendered the relationship between participation and PSS scores non-significant. The relationship between participation and non-judging, however, remained significant and, following outlier removal, program participation was also found to be a significant moderator of change in scores on the anxiety and stress subscales of the DASS-21 (also depicted in Figure 2.8). Participation had a negative effect on the severity of both anxiety and stress, such that more meditation was associated with greater decreases in scores on each measure. Outlier removal did not have an effect on any of the other regressions (i.e., all remained non-significant).

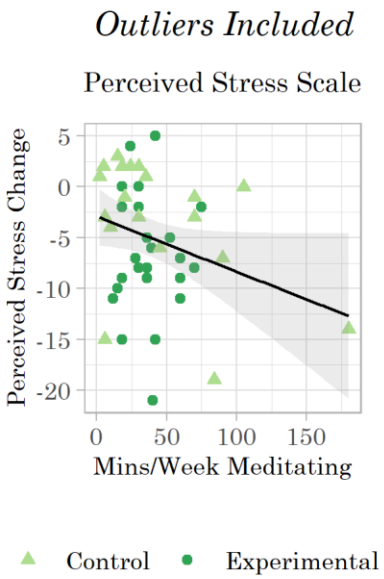
2.3.2.4.2 Per-Protocol Analyses

mITT analyses found that intervention participation was a significant moderator of change in scores on the PSS when outlier values were included. In PP analyses, however, this relationship was not significant (see Figure 2.9); $R^2 = .08$, $F(1, 43) = 3.82$, $p = .06$, $B = -.05$. All other results from PP analyses were found to be comparable to the results from mITT analyses.

2.3.3 Discussion

Participants in the experimental condition were found to have lower T2 levels of negative affect and perceived stress and less severe symptoms associated with stress than participants in the waitlist control condition. Compared to the waitlist control group, experimental participants also displayed higher levels of positive affect and observing at T2. An effect of condition on T2

Figure 2.9. The Mindful Lawyer Study 2 — Per-Protocol Moderations: Changes in perceived stress as a function of time spent meditating during the intervention.



Note. The figure depicts the moderating relationship between minutes per week spent meditating during the intervention and changes in scores on the Perceived Stress Scale before outlier removal. For participants in the control condition (light green/grey triangles), change was calculated as T3 – T2. For participants in the experimental condition (dark green/grey circles), change was calculated as T2 – T1. The shaded area represents a 95% confidence region.

levels of non-reactivity was additionally noted, though this effect was only significant in PP analyses. All other T2 comparisons produced similar outcomes in both the mITT and PP analyses, implying that the Mindful Pause program is effective in reducing stress, improving mood, and enhancing observation abilities and that it has the potential to promote non-reactivity but adherence to the treatment protocol is necessary for this to occur.

Between T1 and T2, attrition was found to be related to both age and condition, with younger participants[25] and participants in the experimental condition being less likely to respond to the T2 assessment than those who were older or in the waitlist control condition. The effect of age on participation is puzzling because the age difference between responders and non-responders was fairly small (M = 44.28 vs. M = 48.61, respectively) and attrition was unrelated to job position, length of time spent working in one's current position, and number of hours spent working per week — all of which are factors that one might expect to be related to age. Participants in this study were, however, predominately female and previous research involving women has found a negative relationship between attrition and age (Young et al., 2006) so this finding may not be entirely unique. The effect of condition on attrition, in contrast, is more readily understandable, as participants likely experienced a decrease in interest and/or perceived obligation towards study participation upon completion of the intervention; this would explain the low rates of responding at both T2 among experimental participants and at T3 among waitlist control participants.

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[25]Younger participants were also less likely to respond to all three assessments overall (see Appendix H).

High rates of T2 to T3 attrition left a small sample of waitlist control participants for T2 and T3 comparisons. Due to this small sample size and a lack of appropriate comparison group, results from T2 and T3 comparisons should be interpreted with caution. Nevertheless, participants in the waitlist control condition seem to have experienced decreases in perceived stress and negative affect and increases in non-judging following completion of the program. The use of different analytic techniques (i.e., between-group vs. within-group analyses) prohibits a direct and accurate comparison between outcomes experienced by participants in the experimental condition and those experienced by participants in the waitlist control condition. It is worth noting though, that control participants seem to have experienced fewer changes than participants in the experimental condition. This apparent discrepancy in outcomes could be related to condition-specific variation in participant characteristics and/or pre-intervention scores (i.e., T1 and T2 scores for the experimental and waitlist control conditions, respectively); this possibility was, therefore, assessed in a series of supplementary follow-up analyses which are presented in Appendix I.

Supplementary analyses found that experimental participants from the PP T2 comparisons had worked in their current position significantly longer than waitlist control participants from the PP T2 and T3 comparisons (M = 12.84 vs. M = 8.69, respectively; p = .04). Analyses further revealed that position length was positively associated with change on the BRS. However, program-related changes on the BRS were not observed so length of time spent in one's current position does not explain any of the condition-based variation in PP outcomes. Comparisons involving participants who were included in mITT analyses revealed no significant demographic differences between conditions but participants in the waitlist control condition were found to have begun the program with significantly higher scores on the awareness subscale of the FFMQ-24 than participants in the experimental condition (M = 15.35 vs. M =

13.32, respectively; $p = .04$). Higher levels of pre-intervention awareness were subsequently found to be associated with less negative change (i.e., smaller decreases) on the PSS and the depression and stress subscales of the DASS-21 and less positive change (i.e., smaller increases) on the positive affect subscale of the PANAS, the BRS, and the observing and awareness subscales of the FFMQ-24. Awareness, therefore, seems to have tempered the amount of change reported by participants; this could explain why control participants with high levels of pre-intervention awareness reported fewer program-related changes than experimental participants, though it remains unclear why this may have occurred. One possibility is that high levels of awareness led to more moderate or pragmatic responding on the assessments, resulting in more conservative outcomes for those in the waitlist control condition compared to those in the experimental condition. Alternatively, pre-intervention awareness may have influenced the way in which participants' engaged in the program, ultimately impacting its effectiveness. Because participants were asked only about the quantity of their participation rather than the quality of their subjective experience during the study, it is difficult to determine which explanation is more accurate. Additional work should be done to clarify how sensitive the Mindful Pause program is to variations in awareness and, in the meantime, individuals interested in implementing or taking part in the program should be aware that it may not be equally efficacious for all.

In addition to awareness, changes evoked by Mindful Pause may be influenced by the amount of time participants spend meditating throughout the program. In particular, program engagement was found to be negatively related to changes in perceived stress, although this relationship was only significant in mITT analyses prior to outlier removal. The non-significant nature of this relationship in analyses excluding outliers and non-meditators suggests that PSS changes as a function of time spent meditating are only

apparent when zero or extreme amounts of meditation are taken into account; among moderately active participants, changes in perceived stress are unlikely to be related to program participation. In contrast, degree of participation does seem to be reasonably predictive of change in non-judging, as time spent meditating was found to be positively related to change on the non-judging subscale of the FFMQ-24 in both mITT and PP analyses both with and without outliers. This finding is consistent with suggestions by Baer and colleagues (2004, 2006) that the ability to observe experiences and sensations without judgment develops gradually over time. Greater engagement was also found to predict greater decreases in the severity of symptoms associated with stress and anxiety but only after outlier removal, implying that there is an amount of meditation beyond which further meditation-induced improvements in symptomatology are unlikely.

The moderating relationship between program engagement and changes in scores on the anxiety subscale of the DASS-21 is interesting given that significant changes in the severity of anxiety symptoms were not observed throughout the study. A failure to detect changes on the DASS-21 anxiety subscale could be due to the structure of the scale, which includes items related to awareness of the body (e.g., "I was aware of dryness of my mouth;" Lovibond & Lovibond, 1995). Bodily awareness might be expected to increase during an intervention involving mindfulness meditation, so a lack of change on this subscale could reflect a decrease on some items that is nullified by an increase on awareness-related items; this could also explain the low levels of internal consistency (i.e., Cronbach's alpha) observed on this subscale in both the T2 comparisons and the full comparisons presented in Section 2.3.2.2 and Appendix H, respectively. Another possibility is that participants began the study with such low levels of anxiety that reductions were unlikely or impossible to occur (i.e., a floor effect). Given that the mean pre-intervention anxiety scores of both conditions were, according to the DASS-21 severity

ratings, close to or within the "normal" range of 0–7 (for the experimental condition, M_{T1} = 6.96 and, for the waitlist control condition, M_{T2} = 9.10),[26] this explanation seems plausible. However, the intervention did have a significant effect on experimental stress symptoms despite experimental T1 scores on the stress subscale also being close to the "normal" range of 0–14 (M = 14.56). It may be, therefore, that Mindful Pause is simply not especially targeted towards anxiety; instead, it seems to be primarily effective in improving mood and reducing stress.

In addition to mood and stress, Mindful Pause seems to have had an impact on some but not all subscales of the FFMQ-24. The program's ability to evoke change in all aspects of trait mindfulness may have been limited by the length of the program. Another thing to consider, however, is that Mindful Pause primarily involves meditation, which does not necessarily imply mindfulness. Consequently, it is also possible that the brief instructional material included in the intervention is not sufficient for invoking a state of mindfulness that was robust enough to initiate measurable changes in trait mindfulness. The observed effects on mood and stress may, instead, be due to some other aspect of the program, such as meditation-induced relaxation; this could explain why the program had no notable impact on depression, anxiety, and resilience — factors that are probably less likely than mood and stress to benefit significantly from simple relaxation.

[26]These values are representative of the experimental and control participants included in T2 comparisons and T2 and T3 comparisons, respectively.

Chapter 3

3 The Mindful Grad Student

Though graduate school provides students with exciting opportunities for personal, academic, and professional growth, it also presents many challenges. Grad students often work long and irregular hours while facing precarious financial conditions, uncertain job prospects, and pressure to publish work and acquire scholarships (Schlemper, 2011; Schramm-Possinger & Powers, 2015). Additionally, grad students are commonly asked to shoulder heavy workloads while filling the multiple roles of scholar, researcher, teaching assistant, mentor, and/or instructor.

Given the abundance of potential stressors in grad school, it is, perhaps, unsurprising that issues regarding health and wellness are widespread in the graduate student community. A 2014 study by The Graduate Assembly at the University of California, Berkeley, for example, found that, of the 790 students who were surveyed, 37% of master's students and 47% of doctoral[27] students screened positive for depression. T. M. Evans et al. (2018) have since declared that there is a graduate student mental health crisis after finding rates of depression and anxiety that were over six times higher among students than in the general public. Whereas norming studies for the Patient Health Questionnaire (Kocalevent et al., 2013) and the Generalized Anxiety Disorder scale (Löwe et al., 2008) found moderate to severe levels of depression and anxiety occurring in approximately 6% of the general population, Evans and colleagues (2018) found rates of 39% — 41% in an international sample of over 2,270 graduate students. More recently, the 2019 National College Health Assessment (American College Health

[27]Master's and PhD students comprised 24% and 67% of the sample, respectively.

Association, 2019), which collected data from over 11,500 graduate and professional students in the United States, noted that 25.5% and 19.7% of students had been diagnosed with and/or sought treatment in the previous year for anxiety and depression, respectively. Over 60% of students further indicated that they had experienced greater than average or tremendous levels of stress in the prior year and, when asked about the academic impact of various factors, stress, anxiety, and depression were the three most commonly cited concerns, with 23.9%, 20.3%, and 14.1% of students indicating that their performance at university had been impacted by stress, anxiety, and depression, respectively.

In addition to mental health issues, alcohol use is exceedingly prevalent in academia (Anonymous Academic, 2016). In fact, 72.4% of respondents to the National College Health Assessment reported that they had consumed alcohol in the past 30 days (American College Health Association, 2019). Though research suggests that graduate students tend to engage in less risky drinking behaviour than undergrads (H. K. Allen, Barrall, et al., 2020), 21.1% of National College Health Assessment respondents indicated that, in the past two weeks, they had consumed five or more drinks in a single sitting and 34.4% of drinkers further attested to driving a vehicle after consuming one or more alcoholic beverages (American College Health Association, 2019). A recent assessment of the motivations behind graduate student alcohol use suggests that consumption quantity is predicted by social factors, implying that students — like many others — drink more in social situations and when the goal is to have fun or to become intoxicated. Consumption frequency, on the other hand, is related more to non-social factors and coping motives, meaning that graduate students struggling with depression, anxiety, and stress may be likely to engage in routine alcohol use in an attempt to deal with the challenges that they face (H. K. Allen, Lilly, et al., 2020).

3.1 The Mindful Grad Student Study

As reviewed in Section 1.5.2, MBIs implemented in university settings have produced a variety of positive outcomes. The majority of university-based research, however, has focused on undergraduates (e.g., Bergen-Cico et al., 2013; Ho et al., 2015; Messer et al., 2016; Morrison et al., 2014; Ramler et al., 2016) and/or specific subgroups, such as athletes (e.g., Baltzell & Akhtar, 2014; Goodman et al., 2014) and students in the healthcare field (e.g., Barbosa et al., 2013; Erogul et al., 2014; Jain et al., 2007; Shapiro et al., 1998; Song & Lindquist, 2015). A study by Barry et al. (2019) is one of the few to assess graduate students specifically, though results were largely similar to those conducted among other student groups. In particular, Barry and colleagues found that, compared to a waitlist control group, graduate students who completed an eight-week MBI involving daily guided meditations had significantly lower scores on the depression subscale of the DASS-42 and significantly higher levels of self-efficacy, hope, resilience, and psychological capital (i.e., psychological resources that facilitate positive growth). Practicing mindfulness, therefore, seems to effectively reduce the severity of depression symptoms and enhance the strength of psychological resources among graduate students.

The study outlined in this chapter sought to add to the literature regarding university-based MBIs by examining the outcomes of a self-directed, web-based intervention administered to graduate and professional students. The program investigated in this study was adapted from the eight-week MBI presented in Cho & Gifford's (2016) book, *The Anxious Lawyer*. A prior evaluation of this program — presented in Section 2.2 — revealed significant pre- to post-intervention increases in positive affect, psychological resilience, and aspects of trait mindfulness, as well as decreases in perceived stress; negative affect; and the severity of symptoms associated with depression, anxiety, and stress. Results from this previous study further suggested that

changes were generally independent of both length of previous meditation experience and degree of program participation. As the same outcome measures were employed in both the present and prior studies, results in this chapter were expected to broadly mirror those in Section 2.2.2. An exact replication of outcomes, however, was not anticipated due to the present investigation's use of an adapted intervention protocol and a waitlist control group. The inclusion of a control group means that the evaluation procedure in this chapter is more rigorous than that of Chapter 2, Study 1; it was predicted, therefore, that the present assessment may reveal comparatively fewer significant results, though any direct comparisons between the two studies should be made with caution as the MBIs under consideration are not identical.

3.2 Method

3.2.1 Participants

North American graduate students, professional students, and postdoctoral fellows were invited to participate in a study on mindfulness and well-being. Recruitment was conducted online via email and social media and interested individuals were directed to a web-based Microsoft Form where they were asked to enter their email address. All individuals were contacted and a total of 223 were enrolled after confirming a desire to participate in the study. Participants were randomly assigned to either an experimental (n = 112) or waitlist control group (n = 111). The experimental group was provided with a program start-date that was shortly after random assignment occurred, while the waitlist control group was given a start-date that was after the experimental group's program was scheduled to end. Study participants were not offered any compensation. Two participants in the waitlist control condition were excluded from data analysis (but were permitted to participate in the program) because they reported being university staff as

opposed to students or postdoctoral fellows. Of the remaining 221 individuals who were recruited, 141 responded to at least one of the three assessments in the study.

3.2.2 Intervention

The intervention for this study was adapted from the Anxious Lawyer program described in Section 2.2.1.2. As in the original program, this intervention consisted of weekly readings and guided meditations. Readings were summarized from *The Anxious Lawyer* (Cho & Gifford, 2016) and provided general information about mindfulness and mindfulness techniques; these summarizations (available in Appendix J) made no mention of the legal practice. The guided meditations used in this intervention were borrowed with Cho's permission from the Anxious Lawyer program. Informal practices, however, were not assigned (though a few were suggested in the weekly readings) and, due to time constraints, this study employed a 4-week version of the intervention that covered only the first five topics from the Anxious Lawyer program. Weeks 1-3 progressed as outlined in Table 2.1 while Week 4 combined the topics of Compassion Towards Others and Self-Compassion (i.e., Weeks 4 and 5 in the original program).

The entire program was hosted on OWL — the University of Western Ontario's online learning platform. Separate sites were used for each condition, though the only difference between the two was the dates on which the intervention pages were unlocked. Both sites included a homepage that provided a description of the study procedures and timeline. Program modules were presented on separate pages on each site and contained the weekly readings, embedded versions of the weekly guided meditations, and links that allowed participants to download the meditations for offline listening. Module pages were unlocked on a weekly basis throughout the

program and remained unlocked for the duration of the study, meaning that participants were not strictly limited to one type of meditation per week.

3.2.3 Self-Report Assessments

Self-reports included a demographic survey (see Appendix K), a series of questions regarding prior experience with meditation and other contemplative practices (presented in Appendix C), the PSS, PANAS, BRS, FFMQ-24, and DASS-21 (see Section 2.2.1.3)[28]. All measures were presented online via Qualtrics (2005).

3.2.4 Procedure

All participants were given immediate access to their site homepage and a page that provided a link to a T1 assessment, consisting of the demographic survey, PSS, PANAS, BRS, FFMQ-24, and the DASS-21. These measures were presented in the same order for all participants. Participants in the experimental condition then began the 4-week intervention; access to the first module was granted after participants had responded to the T1 assessment and each subsequent module was unlocked on a weekly basis after that. Participants were instructed to try to meditate at least once per day and were reminded to make a note of when and for how long they meditated each time that they practiced. Participants in the waitlist control condition were not given any instructions during this 4-week period.

After the experimental group had finished the program, all participants were asked to complete a T2 assessment. The T2 assessment was identical to the

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[28]Participants were also asked to complete the Multidimensional Emotional Intelligence Assessment – Workplace (Tett et al., 2006) and the Meditation Intentions Questionnaire (Kharlas, 2018). These measures were included as part of questionnaire validation projects being conducted separately from this study by other researchers. These measures, therefore, will not be discussed further.

T1 assessment with the following exceptions: (1) the demographic survey was removed and, (2) for participants in the experimental condition, questions regarding program participation were added. After responding to the T2 assessment, participants in the waitlist control condition were granted access to the first module and subsequent modules were unlocked at the beginning of each following week. Participants in the experimental condition were not given any instructions during this 4-week period. After the waitlist control group had finished the program, all participants were asked to complete a T3 assessment. The T3 assessment was identical to the T2 assessment with the following exceptions: (1) questions regarding program participation were provided to participants in the control condition and (2) participants in the experimental condition were asked whether they had continued to practice meditation on their own in the 4 weeks since they had completed the program. (Questions regarding program participation and continued practice are available in appendices E and G, respectively.) A link to a debriefing form was provided to all participants at the end of the T3 assessment.

Throughout the study, participants were sent notifications via OWL to indicate when intervention modules had been unlocked and assessments were available for them to complete. Each of the three assessments began with a LOI that explained the study procedures and indicated that consent would be inferred by way of continued participation in the study. To proceed with each assessment, participants were required to click a button to express that they had read the LOI and consented to participate. Participants were also given the opportunity to download a copy of the LOI for their records. All participants were provided with unique ID numbers at the beginning of the study and were asked to enter these numbers at the beginning of each assessment to facilitate the linking of responses across time. Study procedures were conducted in accordance with an ethics protocol approved by Western's REB (see Appendix L.)

3.3 Results

The dataset for this study is available on OSF (https://osf.io/2afdp/). Psychological assessments were scored as described in Section 2.2.1.3 and variables were created to represent years of previous meditation experience (see Appendix C; this variable was created from items in the T1 assessment) and minutes per week spent meditating during the program (see Appendix E; these items appeared in the T2 assessment for the experimental group and the T3 assessment for the waitlist control group). PP analyses in this study differed from mITT analyses in that they excluded participants who did not actively participate in the intervention and those who reported participating in alternative MBIs throughout the study.

3.3.1 Comparisons Across All Three Time Points

An analysis plan registered on OSF proposed performing a 2 x 3 mixed ANOVA for each measure with condition as a between-group factor and time as a within-group factor. However, of the 141 participants who responded to at least one of the assessments, only 39 ($n_{\text{Experimental}} = 18$) provided responses to all three assessments. Among these 39 was one participant who indicated that they were actively participating in another MBI during the study and three participants who indicated that they did not meditate at all throughout the program; all four were in the waitlist control condition. Consequently, for PP analyses, $n = 35$ and, for mITT analyses, $n = 39$.

mITT analyses revealed the following: (1) an overall increase in describing from both T1 and T2 to T3 (i.e., no change between T1 and T2 but higher scores at T3 than at both previous time points); (2) a T1 to T3 increase in positive affect and decrease in the severity of symptoms associated with anxiety; (3) for those in the experimental condition, a T1 to T2/ T3 decrease in perceived stress, negative affect, and the severity of depressive and stress-related symptoms, accompanied by an increase in non-reactivity, awareness,

and non-judging; (4) for those in the waitlist control condition, an increase in perceived stress from T1 to T2, a decrease in perceived stress and negative affect from both T1 and T2 to T3, a T2 to T3 increase in non-judging, and a T2 to T3 decrease in the severity of symptoms associated with stress. PP results were comparable to mITT results with the following exceptions: (1) rather than condition-specific effects regarding depression, the severity of depressive symptoms was found to decrease from T1 to T2/T3 for both conditions combined (i.e., the main effect of time was significant rather than the interaction); additionally, for those in the waitlist control condition, (2) T1 to T2/T3 changes in perceived stress were not significant and (3) stress symptom severity did not significantly change across any of the three time points.

Overall, results were generally consistent with the hypotheses made in this study but the small sample sizes considered in these analyses make it difficult to draw generalizable conclusions. As a result, these analyses are presented in Appendix M and will not be discussed in detail. Instead, program-related effects were assessed by analyzing condition-specific differences at T2 (i.e., the time after which the experimental condition had completed the program and the waitlist control condition had received no instruction). Program-related changes among waitlist control participants were also assessed by performing T2 and T3 comparisons.

3.3.2 Time 2 Comparisons

For each measure, condition-specific differences in T2 scores were assessed using an ANCOVA, with condition as the independent variable, T2 scores as the dependent variable, and T1 scores as the covariate. In cases of heteroscedasticity and/or heterogeneity of regression slopes, trimmed means were compared at specific levels of the covariate via Yuen's *t*-tests (see Footnote 13).

3.3.2.1 Participant Attrition

One hundred thirty-eight participants ($n_{\text{Experimental}} = 77$) provided responses to the T1 assessment. Of these 138, 83 ($n_{\text{Experimental}} = 34$) responded to the T2 assessment, resulting in an overall attrition rate of 39.86% between the first two time periods. A chi-square test indicated that attrition was significantly higher in the experimental condition (55.84%) than in the waitlist control condition (19.67%); $\chi^2(1, N = 138) = 18.58$, $p < .001$, $V = .37$. Attrition was not found to be affected by gender, enrollment status, program of study, or length of previous meditation experience; $\chi^2(1, N = 138) = .79$, $p = .38$, $V = .08$; $\chi^2_{\text{lr}}(2, N = 138) = .94$, $p = .63$, $V = .08$; $\chi^2_{\text{lr}}(3, N = 138) = 2.85$, $p = .42$, $V = .14$; and $z = -.71$, $p = .48$, $r = -.06$, respectively.

3.3.2.2 Modified Intention-to-Treat Analyses

For the mITT analyses, $n = 83$ ($n_{\text{Experimental}} = 34$); characteristics of these 83 participants are presented in Table 3.1. None of the characteristics differed significantly across conditions among these participants; gender, $\chi^2(1, N = 83) = 1.18$, $p = .28$, $V = .12$; enrollment status, $\chi^2_{\text{lr}}(2, N = 83) = 3.90$, $p = .14$, $V = .21$; program of study, $\chi^2_{\text{lr}}(3, N = 83) = 3.59$, $p = .31$, $V = .20$; and years of previous meditation experience, $z = .31$, $p = .76$, $r = .04$. Visualizations of the ANCOVAs and Yuen's t-tests that were performed in this section are presented in figures 3.1 and 3.2, respectively. Descriptive statistics from each test are displayed in tables 3.2 and 3.3. Scales generally displayed adequate levels of internal consistency (i.e., $\alpha \geq .70$; see Table 3.4), though Cronbach's alpha was found to be low at T1 on the observing subscale of the FFMQ-24 among participants in the experimental condition.

3.3.2.2.1 Perceived Stress Scale

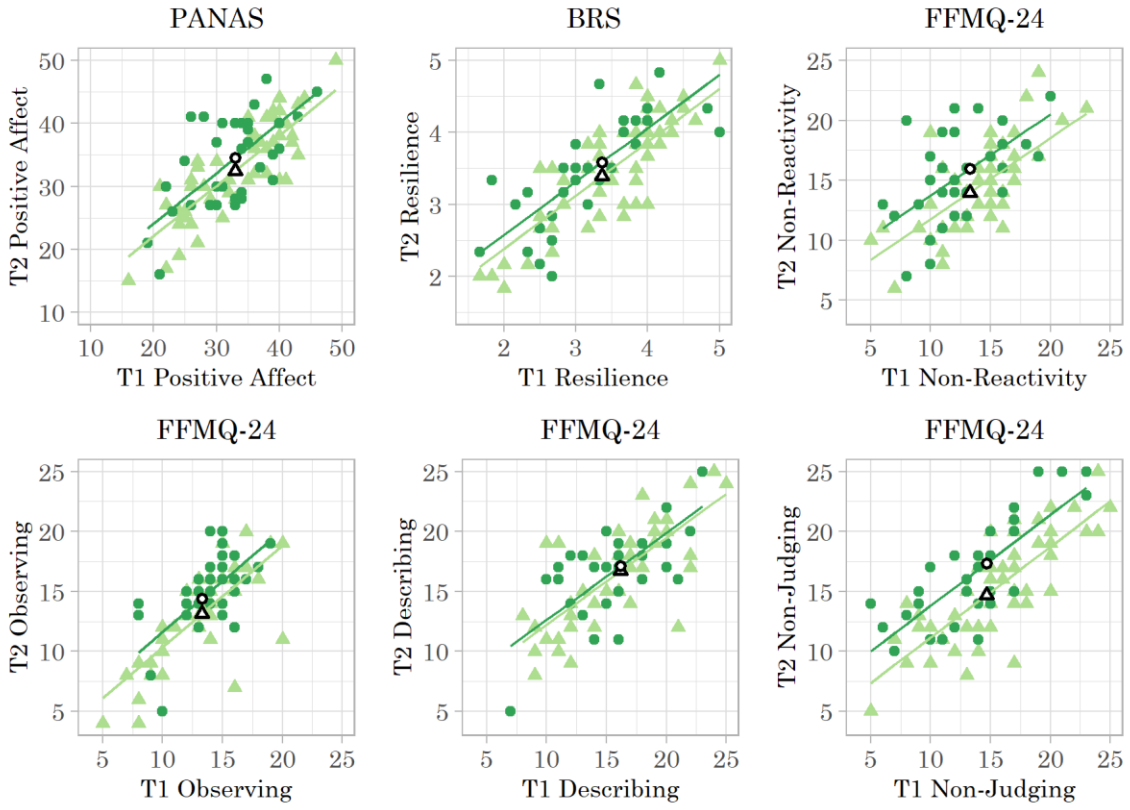
A non-parametric approach was used to assess T2 differences on the PSS because regression slopes were found to be heterogeneous. Trimmed means were compared at T1 = 18.00, 28.00, and 37.00. This analysis revealed that

Table 3.1. The Mindful Grad Student — Time 2 Comparisons: Participant characteristics.

	Control			Experimental			Overall		
Characteristic	n	M	SD	n	M	SD	n	M	SD
Previous Meditation Experience (Years)[a]	46	1.28	3.41	31	.70	1.40	77	1.04	2.78
Meditation During the Program (Mins/Week)		N/A		34	48.24	42.29			
Gender									
Male	12			5			17		
Female	37			29			66		
Enrollment Status									
Full-Time	48			30			78		
Part-Time	1			3			4		
Other	0			1			1		
Program of Study									
Master's	25			21			46		
Doctoral	20			11			31		
Professional Degree	4			1			5		
Other	0			1			1		

[a]Six participants ($n_{\text{Experimental}} = 3$) have been excluded because they indicated that they had 3+ years of meditation experience but failed to further specify the number of years of experience that they possessed.

Figure 3.1. The Mindful Grad Student — Modified Intention-to-Treat Time 2 Comparisons: Visual depictions of analysis of covariance tests.



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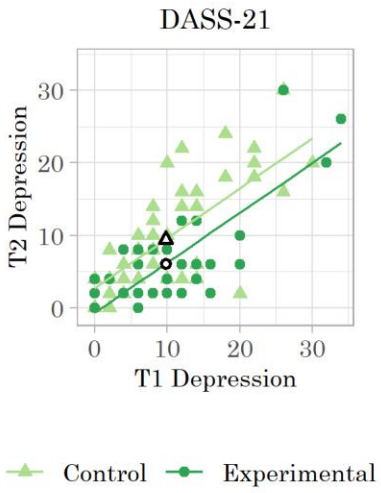
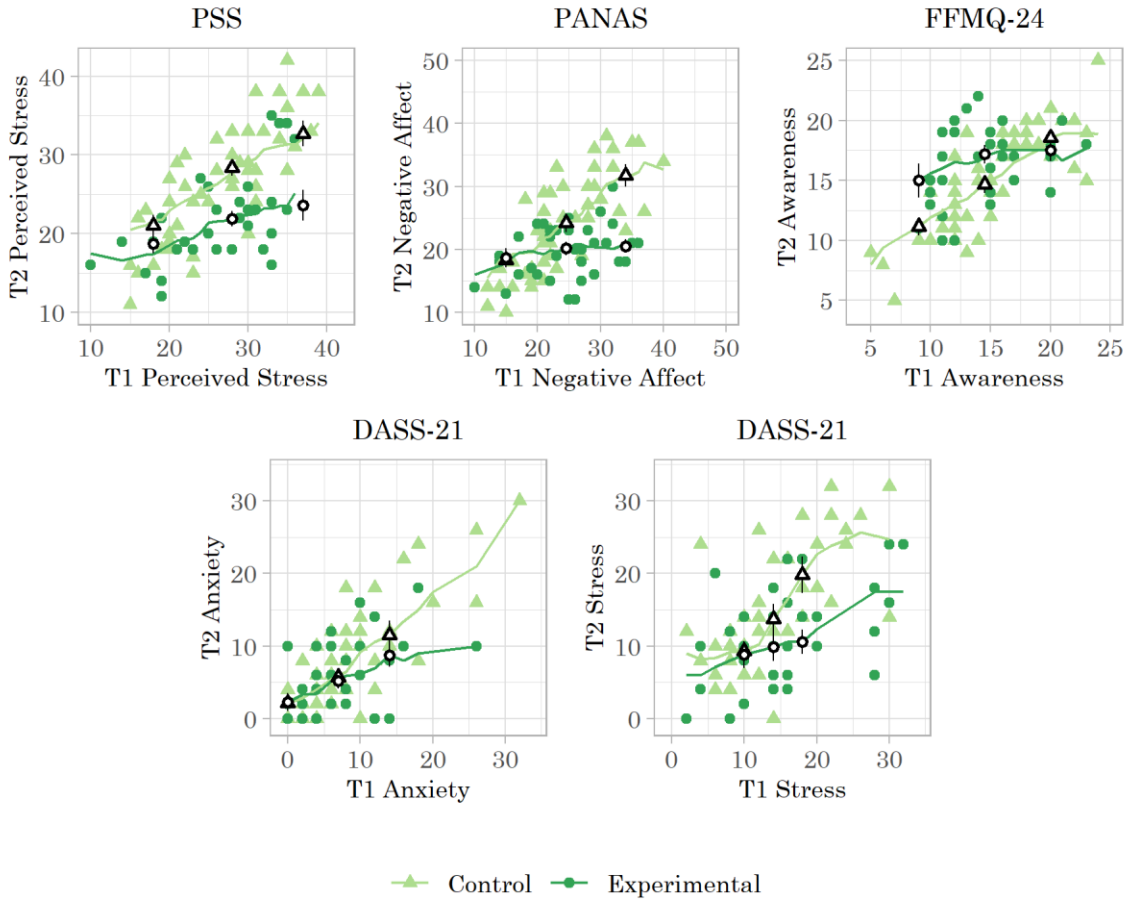
(Figure 3.1 continued.)



Note. Plots depict Time 2 (T2) scores as a function of both Time 1 (T1) scores and condition (control = light green/grey triangles; experimental = dark green/grey circles). Regression lines illustrate the models used to test for condition-specific differences in T2 scores on the positive affect subscale of the Positive and Negative Affect Schedule (PANAS); the Brief Resilience Scale (BRS); the non-reactivity, observing, describing, and non-judging subscales of the Five Facet Mindfulness Questionnaire-24 (FFMQ-24); and the depression subscale of the Depression Anxiety Stress Scales-21 (DASS-21). Open triangles and circles represent adjusted means for the control and experimental conditions, respectively. Whiskers representing the standard errors of the adjusted means are also plotted but are too small to be visible.

Figure 3.2. The Mindful Grad Student — Modified Intention-to-Treat Time 2 Comparisons: Visual depictions of Yuen's tests.



Note. Plots depict Time 2 (T2) scores as a function of both Time 1(T1) scores and condition (control = light green/grey triangles; experimental = dark green/grey circles). Nonparametric regression lines illustrate the results of running interval trimmed mean smoothing functions that have been applied to scores on the Perceived Stress Scale (PSS), the negative affect subscale of the Positive and Negative Affect Schedule (PANAS), the awareness subscale of the Five Facet Mindfulness Questionnaire-24 (FFMQ-24), and the anxiety and stress subscales of the Depression Anxiety Stress Scales-21 (DASS-21). Open triangles and circles represent the comparison points (i.e., trimmed means of the control and experimental conditions, respectively) used to test for condition-specific differences in T2 scores at certain levels of T1. Whiskers represent standard errors of the trimmed means.

Table 3.2. The Mindful Grad Student — Modified Intention-to-Treat Time 2 Comparisons: Time 1 grand means and Time 2 adjusted means and standard errors for measures analyzed via analysis of covariance tests.

		Control	Experimental
Measure	Time 1 (M_G)	Time 2 ($M_{adj} \pm SE$)	Time 2 ($M_{adj} \pm SE$)
Positive and Negative Affect Schedule			
Positive Affect	32.98	32.48 ± .69	34.49 ± .83
Brief Resilience Scale			
	3.37	3.40 ± .06	3.59 ± .08
Five Facet Mindfulness Questionnaire-24			
Non-Reactivity*	13.28	13.99 ± .41	15.96 ± .49
Observing*	13.30	13.15 ± .36	14.43 ± .44
Describing	16.18	16.72 ± .39	17.11 ± .47
Non-Judging*	14.69	14.71 ± .38	17.36 ± .46
Depression Anxiety Stress Scales-21			
Depression*	9.76	9.45 ± .66	6.08 ± .79

*$p \leq .05$.

Table 3.3. The Mindful Grad Student — Modified Intention-to-Treat Time 2 Comparisons: Time 1 comparison points and Time 2 trimmed means and standard errors for measures analyzed via Yuen's tests.

		Control	Experimental
Measure	Time 1	Time 2 ($M_t \pm SE$)	Time 2 ($M_t \pm SE$)
Perceived Stress Scale			
	18.00	21.07 ± 1.31	18.75 ± 1.27
	28.00*	28.38 ± 1.01	21.88 ± .99
	37.00*	32.69 ± 1.64	23.60 ± 1.99
Positive and Negative Affect Schedule			
Negative Affect	15.00	18.33 ± 1.24	18.67 ± 1.56
	24.50	24.19 ± 1.49	20.14 ± 1.06
	34.00*	31.77 ± 1.78	20.50 ± 1.07
Five Facet Mindfulness Questionnaire-24			
Awareness	9.00*	11.17 ± .74	15.00 ± 1.41
	14.50*	14.70 ± .74	17.19 ± .78
	20.00	18.58 ± .44	17.50 ± .91
Depression Anxiety Stress Scales-21			
Anxiety	.00	2.14 ± .82	2.25 ± 1.24
	7.00	5.73 ± .98	5.20 ± .1.11
	14.00	11.50 ± 1.97	8.75 ± .1.61
Stress	10.00	9.33 ± 1.05	8.80 ± 1.87
	14.00	13.75 ± 2.01	9.83 ± 1.88
	18.00*	19.82 ± 2.50	10.55 ± 1.69

*$p \leq .05$.

Table 3.4. The Mindful Grad Student — Modified Intention-to-Treat Time 2 Comparisons: Internal consistency (α) of the scales used.

	Control Condition			Experimental Condition			Conditions Combined		
Measure	Time 1	Time 2	Overall	Time 1	Time 2	Overall	Time 1	Time 2	Overall
Perceived Stress Scale									
	.85	.86	.85	.85	.81	.85	.84	.87	.86
Positive and Negative Affect Schedule									
Positive Affect	.90	.91	.90	.88	.92	.90	.89	.91	.90
Negative Affect	.83	.89	.86	.80	.75	.82	.81	.88	.85
Brief Resilience Scale									
	.89	.91	.90	.91	.89	.90	.90	.90	.90
Five Facet Mindfulness Questionnaire-24									
Non-Reactivity	.77	.83	.80	.85	.85	.87	.80	.84	.83
Observing	.76	.91	.84	.67	.84	.77	.74	.90	.83
Awareness	.89	.89	.89	.88	.82	.86	.89	.87	.88
Describing	.87	.89	.88	.88	.88	.88	.87	.89	.88
Non-Judging	.80	.84	.82	.85	.90	.89	.83	.86	.85
Depression Anxiety Stress Scales-21									
Depression	.86	.86	.86	.89	.90	.89	.87	.87	.87
Anxiety	.81	.82	.81	.70	.74	.72	.77	.80	.79
Stress	.70	.85	.79	.80	.79	.81	.75	.84	.80

participants in the experimental condition had significantly lower T2 PSS scores than participants in the control condition at both T1 = 28.00 and 37.00; $t_Y(34.15) = 4.75$, $p_{adj} < .001$, $\xi = .67$ and $t_Y(17.68) = 3.74$, $p_{adj} = .003$, $\xi = .73$, respectively. T2 PSS scores did not differ between conditions at T1 = 18.00; $t_Y(18.87) = 1.36$, $p_{adj} = .19$, $\xi = .31$.

3.3.2.2.2 Positive and Negative Affect Schedule

After adjusting for differences in T1 scores, no T2 differences were observed between conditions on the positive affect subscale of the PANAS; $F(1, 80) = 3.44$, $p = .07$, $\eta^2_G = .04$. A non-parametric approach was used to assess T2 differences on the negative affect subscale because regression slopes were found to be heterogeneous. Trimmed means were compared at T1 = 15.00, 24.50, and 34.00. This analysis revealed that participants in the experimental condition had significantly lower T2 scores on the negative affect subscale than participants in the control condition at T1 = 34.00 $t_Y(18.59) = 6.17$, $p_{adj} < .001$, $\xi = .85$. T2 negative affect scores did not differ between conditions at T1 = 15.00 or 24.50; $t_Y(19.22) = .18$, $p_{adj} = .86$, $\xi = .09$ and $t_Y(32.61) = 2.32$, $p_{adj} = .05$,[29] $\xi = .46$, respectively.

3.3.2.2.3 Brief Resilience Scale

After adjusting for differences in T1 scores, no T2 differences were observed between conditions on the BRS; $F(1, 80) = 3.51$, $p = .06$, $\eta^2_G = .04$.

3.3.2.2.4 Five Facet Mindfulness Questionnaire-24

After adjusting for differences in T1 scores, participants in the experimental condition were found to have significantly higher T2 scores on the non-

[29]This number has been rounded to two decimal places but is, in fact, > .05.

reactivity, observing, and non-judging subscales of the FFMQ-24 than participants in the control condition; $F(1, 80) = 9.22$, $p = .003$, $\eta^2_G = .10$; $F(1, 80) = 4.88$, $p = .03$, $\eta^2_G = .06$; and $F(1, 80) = 19.70$, $p < .001$, $\eta^2_G = .20$, respectively. T2 differences were not observed between conditions on the describing subscale; $F(1, 80) = .42$, $p = .52$, $\eta^2_G = .01$. A non-parametric approach was used to assess T2 differences on the awareness subscale because regression slopes were found to be heterogeneous. Trimmed means were compared at T1 = 9.00, 14.50, and 20.00. This analysis revealed that participants in the experimental condition had significantly higher T2 scores on the awareness subscale than participants in the control condition at both T1 = 9.00 and 14.50; $t_Y(15.45) = 2.71$, $p_{adj} = .05$, $\xi = .61$ and $t_Y(33.61) = 2.47$, $p_{adj} = .05$, $\xi = .42$, respectively. T2 awareness scores did not differ between conditions at T1 = 20.00; $t_Y(11.10) = 1.14$, $p_{adj} = .28$, $\xi = .33$.

3.3.2.2.5 Depression Anxiety Stress Scales-21

The spread of participants across each of the DASS-21 severity categories is outlined in Table 3.5. Between condition comparisons suggest that the experimental condition began the study with more non-normal levels of depression, anxiety, and stress than the waitlist control condition. However, symptom severity seems to have declined over time among those in the experimental condition and, by T2, larger proportions of the experimental condition fell within the normal range on each of the three subscales than did the waitlist control condition.

After adjusting for differences in T1 scores, participants in the experimental condition were found to have significantly lower T2 scores on the depression subscale of the DASS-21 than participants in the control condition; $F(1, 80) = 10.64$, $p = .002$, $\eta^2_G = .12$. A non-parametric approach was used to assess T2 differences on the anxiety and stress subscales because regression slopes were found to be heterogeneous for both. For the anxiety subscale, trimmed

Table 3.5. The Mindful Grad Student — Modified Intention-to-Treat Time 2 Comparisons: Percentage of participant responses on the Depression Anxiety Stress Scales-21 that fall in each of the symptom severity categories.

	Depression		Anxiety		Stress	
Symptom Severity	Time 1	Time 2	Time 1	Time 2	Time 1	Time 2
Control Condition[a]						
Normal	59.18	59.18	55.10	51.02	63.27	57.14
Mild	14.29	10.20	12.24	12.24	14.29	12.2
Moderate	14.29	22.49	18.37	20.41	16.33	14.29
Severe	10.20	6.12	6.12	8.16	6.12	16.33
Extremely Severe	2.04	2.04	8.16	8.16	.00	.00
Experimental Condition[b]						
Normal	47.06	82.35	52.94	61.76	52.94	73.53
Mild	20.59	8.82	8.82	5.88	20.59	11.76
Moderate	23.53	2.94	29.41	26.47	8.82	14.71
Severe	2.94	2.94	5.88	5.88	17.65	.00
Extremely Severe	5.88	2.94	2.94	.00	.00	.00

Note. [a]$n = 49$. [b]$n = 34$.

means were compared at T1 = .00, 7.00, and 14.00. This analysis revealed no significant differences between conditions on T2 anxiety scores at any of the T1 values considered; at .00, $t_Y(13.52) = .08$, $p_{adj} = 1.00$, $\xi = .10$; at 7.00, $t_Y(29.91) = .36$, $p_{adj} = 1.00$, $\xi = .08$; and at 14.00, $t_Y(13.48) = 1.17$, $p_{adj} = .78$, $\xi = .32$. For the stress subscale, trimmed means were compared at T1 = 10.00, 14.00, and 18.00. This analysis revealed that participants in the experimental condition had significantly lower T2 scores on the stress subscale than participants in the control condition at T1 = 18.00; $t_Y(17.56) = 3.26$, $p_{adj} = .01$, $\xi = .69$. T2 stress scores did not differ between conditions at T1 = 10.00 or 14.00; $t_Y(15.97) = .28$, $p_{adj} = .78$, $\xi = .11$ and $t_Y(25.78) = 1.56$, $p_{adj} = .26$, $\xi = .38$, respectively.

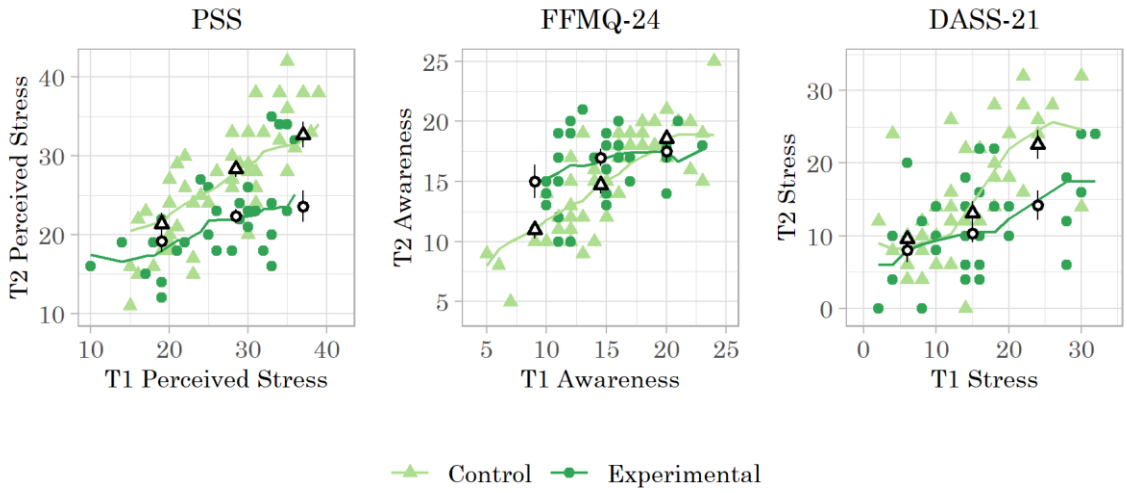
3.3.2.3 Per-Protocol Analyses

Of the 83 participants who responded to both the T1 and T2 assessments, one in the experimental condition indicated that they did not meditate at all throughout the program and one in the waitlist control condition indicated that they were actively participating in another MBI during the study. For PP analyses, therefore, $n = 81$ ($n_{Experimental} = 33$). PP analyses deviated from mITT analyses with respect to the PSS, the awareness subscale of the FFMQ-24, and the stress subscale of the DASS-21 (see Figure 3.3). All other results from PP analyses were found to be comparable to the results from mITT analyses.

3.3.2.3.1 Perceived Stress Scale

Whereas mITT analyses compared T2 scores on the PSS at T1 = 18.00, 28.00, and 37.00, PP comparisons were made at the following levels of T1: 19.00 (control, $M_t = 21.40$, $SE = 1.38$; experimental, $M_t = 19.22$, $SE = 1.38$), 28.50 (control, $M_t = 28.39$, $SE = 1.07$; experimental, $M_t = 22.38$, $SE = .91$), and 37.00 (control, $M_t = 32.69$, $SE = 1.64$; experimental, $M_t = 23.60$, $SE = 1.99$). PP

Figure 3.3. The Mindful Grad Student — Per-Protocol Time 2 Comparisons: Visual depictions of Yuen's tests.



Note. Plots depict Time 2 (T2) scores as a function of both Time 1(T1) scores and condition (control = light green/grey triangles; experimental = dark green/grey circles). Nonparametric regression lines illustrate the results of running interval trimmed mean smoothing functions that have been applied to scores on the Perceived Stress Scale (PSS), the awareness subscale of the Five Facet Mindfulness Questionnaire-24 (FFMQ-24), and the stress subscale of the Depression Anxiety Stress Scales-21 (DASS-21). Open triangles and circles represent the comparison points (i.e., trimmed means of the control and experimental conditions, respectively) used to test for condition-specific differences in T2 scores at certain levels of T1. Whiskers represent standard errors of the trimmed means.

results, however, were similar to mITT analyses in that there was no difference in T2 PSS scores at the lower T1 comparison point (i.e., T1 = 19.00) but, at the middle and upper comparison points (i.e., T1 = 28.50 and 37.00), participants in the experimental condition were found to have significantly lower T2 scores on the PSS than participants in the control condition; at 19.00, $t_Y(20.84) = 1.23$, $p_{adj} = .23$, $\xi = .30$; at 28.50, $t_Y(30.80) = 4.43$, $p_{adj} < .001$, $\xi = .62$; and at 37.00; $t_Y(17.68) = 3.74$, $p_{adj} = .003$, $\xi = .72$.

3.3.2.3.2 Five Facet Mindfulness Questionnaire-24

As in mITT analyses, PP analyses compared T2 scores on the awareness subscale of the FFMQ-24 at T1 = 9.00 (control, $M_t = 11.00$, $SE = .74$; experimental, $M_t = 15.00$, $SE = 1.41$), 14.50 (control, $M_t = 14.74$, $SE = .76$; experimental, $M_t = 17.00$, $SE = .71$), and 20.00 (control, $M_t = 18.58$, $SE = .44$; experimental, $M_t = 17.50$, $SE = .91$). mITT analyses found significant T2 awareness differences at T1 = 9.00 and 14.50. In PP analyses, however, experimental participants were only found to have significantly higher T2 awareness scores than control participants at T1 = 9.00; $t_Y(14.17) = 2.92$, $p_{adj} = .03$, $\xi = .65$. T2 awareness scores did not differ between conditions in PP analyses at T1 = 14.50 or 20.00; $t_Y(32.00) = 2.26$, $p_{adj} = .06$, $\xi = .38$ and $t_Y(11.10) = 1.14$, $p_{adj} = .28$, $\xi = .32$, respectively.

3.3.2.3.3 Depression Anxiety Stress Scales-21

Whereas mITT analyses compared T2 scores on the stress subscale of the DASS-21 at T1 = 10.00, 14.00, and 18.00, PP comparisons were made at the following levels of T1: 6.00 (control, $M_t = 9.58$, $SE = .99$; experimental, $M_t = 8.00$, $SE = 1.67$), 15.00 (control, $M_t = 13.13$, $SE = 1.64$; experimental, $M_t = 10.29$, $SE = 1.22$), and 24.00 (control, $M_t = 22.55$, $SE = 1.99$; experimental, $M_t = 14.20$, $SE = 2.06$). PP results, however, were similar to mITT analyses in that there was no difference in T2 stress scores at the lower or middle T1

comparison points (i.e., T1 = 6.00 and 15.00) but, at the upper comparison point (i.e., T1 = 24.00), participants in the experimental condition were found to have significantly lower T2 scores on the stress subscale of the DASS-21 than participants in the control condition; at T1 = 6.00, $t_Y(17.68) = .85$, $p_{adj} = .41$, $\xi = .21$; at T1 = 15.00, $t_Y(34.91) = 1.44$, $p_{adj} = .32$, $\xi = .29$; and at T1 = 24.00; $t_Y(18.69) = 3.03$, $p_{adj} = .02$, $\xi = .74$.

3.3.3 Time 2 and 3 Comparisons

Pre- to post-intervention changes were assessed for those in the waitlist control condition via paired samples t-tests or, in cases of non-normality, Wilcoxon signed-rank tests. Though T2 and T3 data was also collected from participants in the experimental condition, some experimental participants continued to meditate throughout this time period and those who did not may have been influenced by long-term carry-over effects from the program; this data, therefore, is unsuitable for use as a control in these tests. As a result, only changes in the waitlist control condition are assessed in these analyses and the results in this section should be interpreted with caution due to the lack of a comparison group.

3.3.3.1 Participant Attrition

Fifty-two waitlist control participants provided responses to the T2 assessment. Of these 52, 21 responded to the T3 assessment, resulting in an attrition rate of 59.62%. Attrition was not found to be affected by gender, enrollment status, program of study, or length of previous meditation experience; $\chi^2(1, N = 52) = 2.16$, $p = .14$, $V = .20$; $\chi^2_{lr}(1, N = 52) = 1.84$, $p = .17$, $V = .17$; $\chi^2_{lr}(2, N = 52) = 3.98$, $p = .14$, $V = .28$; and $z = -1.20$, $p = .24$, $r = .17$, respectively.

3.3.3.2 Modified Intention-to-Treat Analyses

For the mITT analyses, $n = 21$; characteristics of these participants are presented in Table 3.6. Score distributions are presented in Figure 3.4 and descriptive statistics for each outcome measure are displayed in Table 3.7. Scales generally displayed adequate levels of internal consistency (i.e., $\alpha \geq .70$; see Table 3.8), though Cronbach's alpha was found to be low at T3 on both the non-reactivity subscale of the FFMQ-24 and the stress subscale of the DASS-21.

3.3.3.2.1 Perceived Stress Scale

Analyses revealed a significant T2 to T3 decrease in control scores on the PSS; $t(20) = 4.13$, $p < .001$, $d = .90$.

3.3.3.2.2 Positive and Negative Affect Schedule

Analyses revealed a significant T2 to T3 increase in control scores on the positive affect subscale of the PANAS and a significant T2 to T3 decrease in control scores on the negative affect subscale; $t(20) = -2.22$, $p = .04$, $d = -.48$ and $t(20) = 3.62$, $p = .002$, $d = .79$, respectively.

3.3.3.2.3 Brief Resilience Scale

Analyses revealed that control scores on the BRS did not significantly change from T2 to T3; $t(20) = -1.68$, $p = .11$, $d = -.37$.

3.3.3.2.4 Five Facet Mindfulness Questionnaire-24

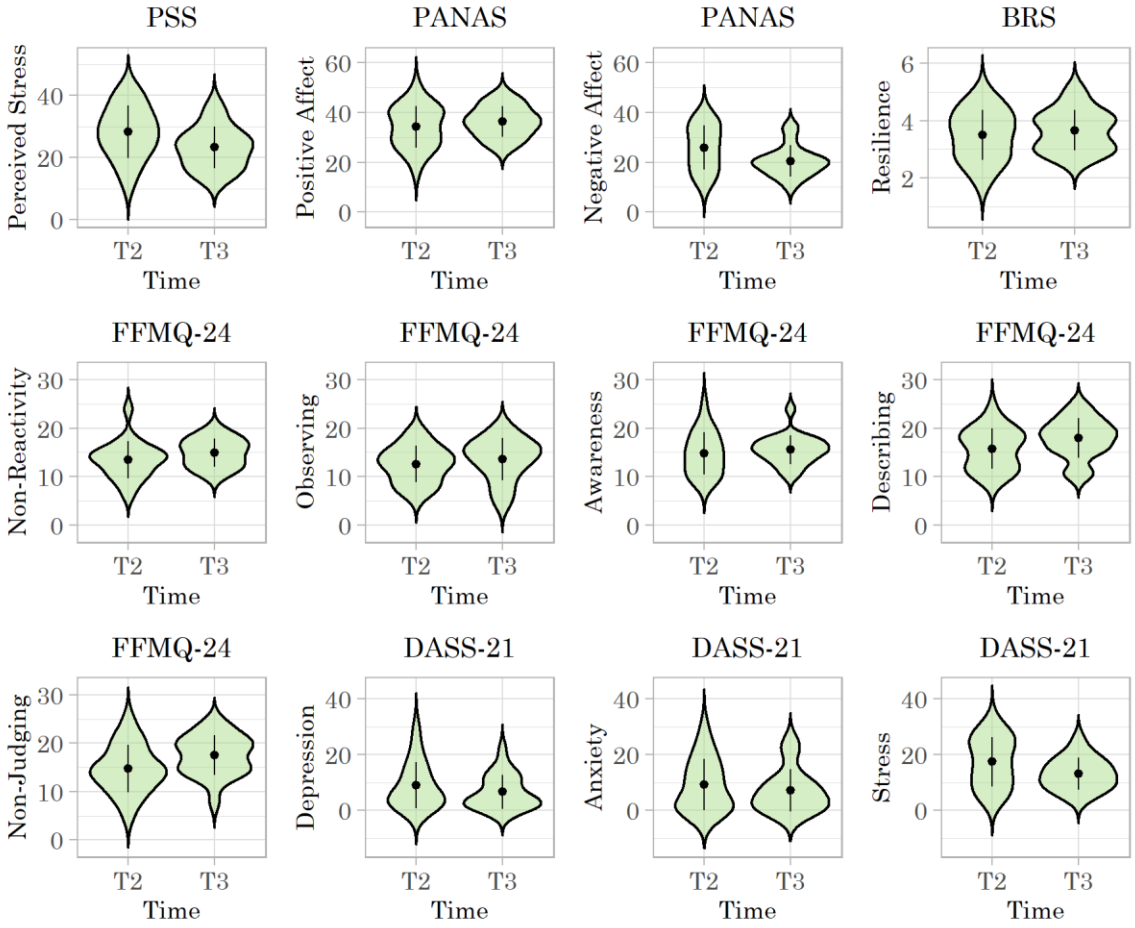
Analyses revealed a significant T2 to T3 increase in control scores on the non-reactivity, describing, and non-judging subscales of the FFMQ-24; $t(20) = -2.21$, $p = .04$, $d = -.48$; $t(20) = -3.67$, $p = .002$, $d = -.80$; and $t(20) = -3.33$, $p = .003$, $d = -.73$, respectively. Control scores on the observing and awareness subscales did not significantly change from T2 to T3; $t(20) = -1.99$, $p = .06$, $d = -.43$ and $t(20) = -.96$, $p = .35$, $d = -.21$, respectively.

Table 3.6. The Mindful Grad Student — Time 2 and 3 Comparisons: Control participant characteristics.

Characteristic	*n*	*M*	*SD*
Previous Meditation Experience (Years)[a]	20	2.10	4.77
Meditation During the Program (Mins/Week)	21	47.74	43.37
Gender			
Male	3		
Female	18		
Enrollment Status			
Full-Time	20		
Part-Time	1		
Program of Study			
Master's	14		
Doctoral	6		
Professional Degree	1		

[a]One participant has been excluded because they indicated that they had 3+ years of meditation experience but failed to further specify the number of years of experience that they possessed.

Figure 3.4. The Mindful Grad Student — Modified Intention-to-Treat Time 2 and 3 Comparisons: Distributions of control participant scores on each of the outcome measures.



Note. Score distributions are shown for the Perceived Stress Scale (PSS); the positive and negative affect subscales of the Positive and Negative Affect Schedule (PANAS); the Brief Resilience Scale (BRS); the non-reactivity, observing, awareness, describing, and non-judging subscales of the Five Facet Mindfulness Questionnaire-24 (FFMQ-24); and the depression, anxiety, and stress subscales of the Depression Anxiety Stress Scales-21 (DASS-21). Scores are depicted at Time 2 (T2) and Time 3 (T3). Dots and whiskers represent means and standard deviations, respectively.

Table 3.7. The Mindful Grad Student — Modified Intention-to-Treat Time 2 and 3 Comparisons: Control means and standard deviations for each measure.

Measure	Time 2 ($M \pm SD$)	Time 3 ($M \pm SD$)
Perceived Stress Scale*		
	28.29 ± 8.48	23.29 ± 6.66
Positive and Negative Affect Schedule		
Positive Affect*	34.29 ± 8.36	36.38 ± 6.13
Negative Affect*	25.86 ± 8.87	20.52 ± 6.19
Brief Resilience Scale		
	3.50 ± .88	3.67 ± .71
Five Facet Mindfulness Questionnaire-24		
Non-Reactivity*	13.43 ± 3.85	14.95 ± 2.89
Observing	12.57 ± 3.75	13.62 ± 4.40
Awareness	14.81 ± 4.41	15.52 ± 3.03
Describing*	15.76 ± 4.16	17.95 ± 4.12
Non-Judging*	14.71 ± 4.91	17.57 ± 4.09
Depression Anxiety Stress Scales-21		
Depression	9.05 ± 8.24	6.67 ± 6.01
Anxiety	9.24 ± 9.22	7.14 ± 7.60
Stress*	17.52 ± 8.81	13.24 ± 5.71

*$p \leq .05$.

Table 3.8. The Mindful Grad Student — Modified Intention-to-Treat Time 2 and 3 Comparisons: Internal consistency (α) of the scales used.

Measure	Time 2	Time 3	Overall
Perceived Stress Scale			
	.88	.81	.87
Positive and Negative Affect Schedule			
Positive Affect	.94	.87	.91
Negative Affect	.90	.85	.89
Brief Resilience Scale			
	.94	.90	.92
Five Facet Mindfulness Questionnaire-24			
Non-Reactivity	.83	.64	.77
Observing	.87	.88	.88
Awareness	.89	.81	.87
Describing	.87	.92	.90
Non-Judging	.87	.85	.87
Depression Anxiety Stress Scales-21			
Depression	.89	.85	.88
Anxiety	.87	.86	.86
Stress	.84	.69	.81

3.3.3.2.5 Depression Anxiety Stress Scales-21

The spread of waitlist control participants across each of the DASS-21 severity categories is outlined in Table 3.9. Participants in the waitlist control condition began the program with more severe levels of anxiety and stress than experimental participants did (see Table 3.5). Compared to the experimental group, the waitlist control group also demonstrated smaller improvements on all measures, though symptom severity does appear to have decreased over time, with T2 to T3 increases in the percentage of control participants falling into the normal category on all three of the subscales. This conclusion was partially supported by analyses which revealed a significant T2 to T3 decrease in scores on the stress subscale of the DASS-21*;* $t(20) = 2.48$, $p = .02$, $d = .54$. Decreases in depression and anxiety, however, do not appear to have been particularly notable, as T2 to T3 changes on the depression and anxiety subscales were not found to be significant; $z = 1.67$, $p = .10$, $r = .36$ and $z = 1.89$, $p = .06$, $r = .41$, respectively.

3.3.3.3 Per-Protocol Analyses

Of the 21 waitlist control participants who responded to both the T2 and T3 assessments, two indicated that they did not meditate at all throughout the program and one indicated that they were actively participating in another MBI during the study. For PP analyses, therefore, $n = 18$. PP analyses deviated from mITT analyses with respect to the positive affect subscale of the PANAS, the non-reactivity subscale of the FFMQ-24, and the stress subscale of the DASS-21 (see Figure 3.5). All other results from PP analyses were found to be comparable to the results from mITT analyses.

3.3.3.3.1 Positive and Negative Affect Schedule

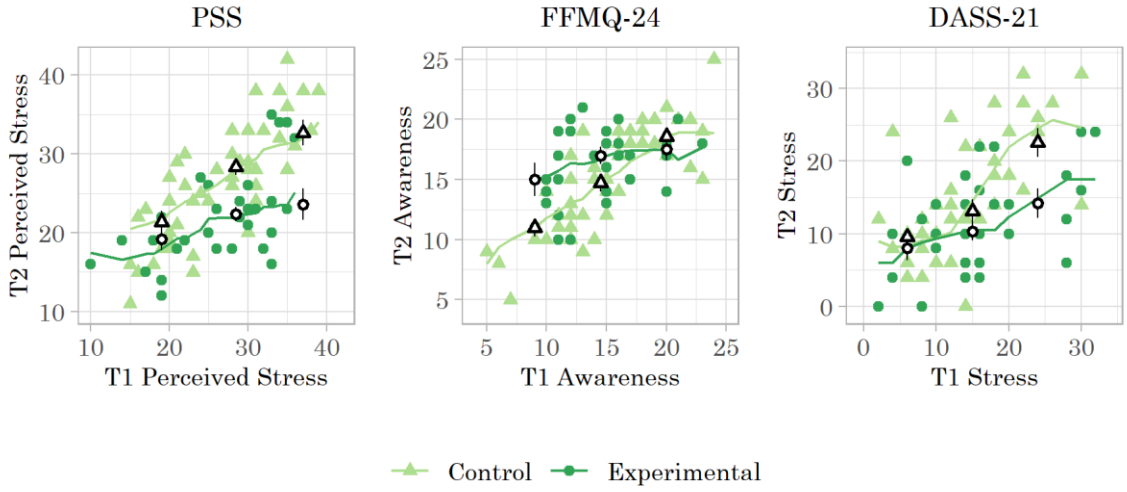
Whereas mITT analyses found a significant increase in control scores on the positive affect subscale of the PANAS, PP analyses revealed no significant T2

Table 3.9. The Mindful Grad Student — Modified Intention-to-Treat Time 2 and 3 Comparisons: Percentage of control participant responses on the Depression Anxiety Stress Scales-21 that fall in each of the symptom severity categories.

	Depression		Anxiety		Stress	
Symptom Severity	Time 2	Time 3	Time 2	Time 3	Time 2	Time 3
Normal	61.90	66.67	47.62	57.14	42.86	66.67
Mild	9.52	19.05	4.76	9.52	9.52	19.05
Moderate	19.05	9.52	19.05	19.05	23.81	9.52
Severe	4.76	4.76	14.29	.00	23.81	4.76
Extremely Severe	4.76	.00	14.29	14.29	.00	.00

Note. $n = 21$.

Figure 3.5. The Mindful Grad Student — Per-Protocol Time 2 and 3 Comparisons: Distributions of control participant scores on the positive affect subscale of the Positive and Negative Affect Schedule (PANAS), the non-reactivity subscale of the Five Facet Mindfulness Questionnaire-24 (FFMQ-24), and the stress subscale of the Depression Anxiety Stress Scales-21 (DASS-21).



Note. Scores are depicted at Time 2 (T2) and Time 3 (T3). Dots and whiskers represent means and standard deviations, respectively.

(M = 33.78, SD = 8.71) to T3 (M = 35.56, SD = 6.18) change in scores on this subscale; $t(17) = -1.69$, $p = .11$, $d = -.40$.

3.3.3.3.2 Five Facet Mindfulness Questionnaire-24

Whereas mITT analyses found a significant increase in control scores on the non-reactivity subscale of the FFMQ-24, PP analyses revealed no significant T2 to T3 change in scores on this subscale; $t(17) = -2.10$, $p = .05$,[30] $d = -.50$.

3.3.3.3.3 Depression Anxiety Stress Scales-21

Whereas mITT analyses found a significant decrease in control scores on the stress subscale of the DASS-21, PP analyses revealed no significant T2 (M = 17.78, SD = 8.59) to T3 (M = 14.33, SD = 5.41) change in scores on this subscale; $t(17) = 2.04$, $p = .06$, $d = .48$.

3.3.4 Moderation of Change Over Time

Exploratory analyses were conducted to determine whether the change in each outcome measure was moderated by length of previous meditation experience or amount of program participation (see Section 2.2.2.2 for an explanation of this process). These analyses included the experimental participants from the T2 comparison analyses and the waitlist control participants from the T2 and T3 comparison analyses.[31] For each outcome measure, change over time was calculated as post-intervention scores – pre-intervention scores (i.e., for experimental participants, T2 – T1 and, for waitlist control participants, T3 – T2). The individual moderating effects of

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[30]This number has been rounded to two decimal places but is, in fact, > .05.

[31]Note that four participants ($n_{Experimental}$ = 3) were excluded from analyses regarding experience because they failed to specify the amount of meditation experience that they possessed.

experience and participation were then assessed for each measure with separate regression analyses.

3.3.4.1 Modified Intention-to-Treat Analyses

Regression results are presented in Tables 3.10 and 3.11. Intervention participation was found to be a significant moderator of change in scores on both the observing subscale of the FFMQ-24 and the depression subscale of the DASS-21 (see Figure 3.6). In particular, more time spent meditating was found to be associated with more positive change (i.e., larger increases) on the FFMQ-24 observing subscale and more negative change (i.e., larger decreases) on the DASS-21 depression subscale over time. Note, however, that these relationships seem to have been influenced by four outlier participants who reported meditating for between 138.00 and 210.00 minutes per week; using a standard cut-off of 1.5 × the interquartile range, three experience values ranging from 7.00 to 20.00 years of meditation experience were also identified as outliers. The removal of outlier responses ultimately rendered both of the previously significant relationships non-significant. Following outlier removal, program participation was found to be a significant moderator of change in scores on the anxiety subscale of the DASS-21 (also depicted in Figure 3.6). Participation had a negative effect on anxiety severity, such that more meditation was associated with greater decreases in scores on the DASS-21 anxiety subscale. Outlier removal did not have an effect on any of the other regressions (i.e., all remained non-significant).

3.3.4.2 Per-Protocol Analyses

mITT analyses found that intervention participation was a significant moderator of change in scores on the depression subscale of the DASS-21 when outlier values were included. In PP analyses, however, this relationship

Table 3.10. The Mindful Grad Student — Modified Intention-to-Treat Moderations: Change over time moderated by years of previous meditation experience.

	All Participants[a]				Outliers Removed[b]			
Measure	R^2	*F*	*p*	*B*	R^2	*F*	*p*	*B*
Perceived Stress Scale								
	.001	.03	.87	.04	< .001	.001	.97	-.03
Positive and Negative Affect Schedule								
Positive Affect	.003	.17	.69	.09	.01	.49	.49	.67
Negative Affect	.05	2.34	.13	.43	.01	.64	.43	.95
Brief Resilience Scale								
	.01	.56	.46	-.02	.01	.38	.54	-.06
Five Facet Mindfulness Questionnaire-24								
Non-Reactivity	.05	2.37	.13	-.23	.04	2.14	.15	-.90
Observing	.03	1.77	.19	-.13	.004	.19	.67	.18
Awareness	.03	1.40	.24	-.19	< .001	.004	.95	-.04
Describing	.01	.66	.42	.10	.001	.06	.81	.12
Non-Judging	.01	.73	.40	-.13	.01	.27	.61	.31
Depression Anxiety Stress Scales-21								
Depression	< .001	.03	.86	.04	< .001	.03	.87	-.16
Anxiety	< .001	< .001	.98	-.01	.06	2.70	.11	-1.58
Stress	.07	3.57	.06	.60	.002	.09	.77	.40

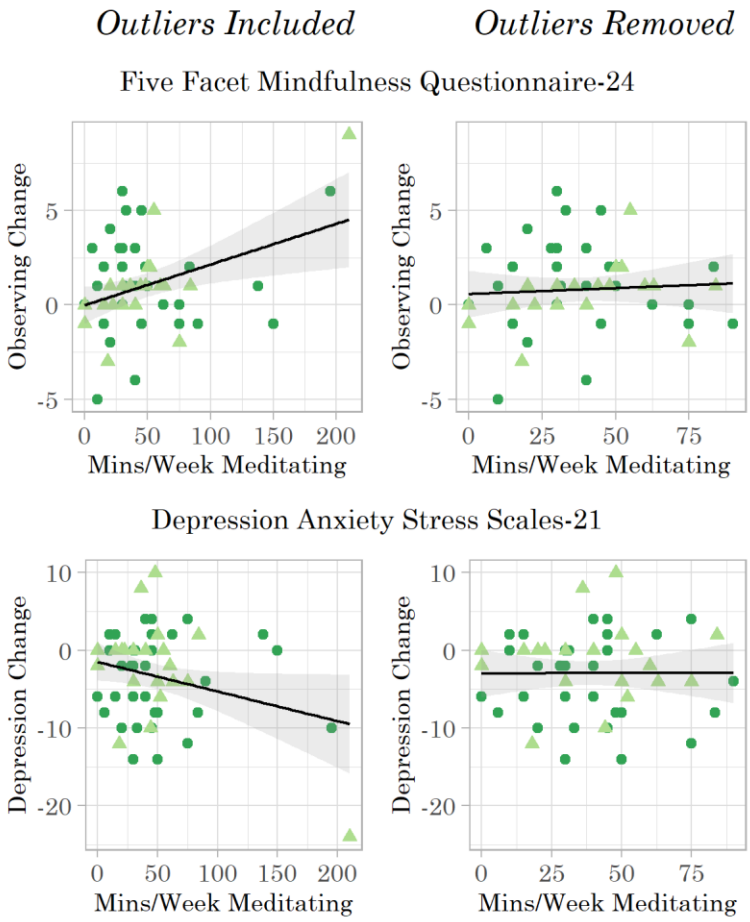
Note. Experimental change was calculated as Time 2 – Time 1. Control change was calculated as Time 3 – Time 2. [a]$df = 1, 49$. [b]$df = 1, 46$.

Table 3.11. The Mindful Grad Student — Modified Intention-to-Treat Moderations: Change over time moderated by minutes per week spent meditating during the program.

	All Participants[a]				Outliers Removed[b]			
Measure	R^2	F	p	B	R^2	F	p	B
Perceived Stress Scale								
	.03	1.45	.23	-.02	< .001	.003	.95	.002
Positive and Negative Affect Schedule								
Positive Affect	.002	.09	.77	.01	.07	3.74	.06	-.06
Negative Affect	.01	.75	.39	-.02	.02	.77	.38	.04
Brief Resilience Scale								
	.02	.90	.35	-.002	.03	1.53	.22	-.004
Five Facet Mindfulness Questionnaire-24								
Non-Reactivity	.01	.29	.59	.01	.04	2.25	.14	-.03
Observing	.13	8.21	.01*	.02	.004	.20	.65	.01
Awareness	.001	.04	.84	.002	< .001	.04	.84	.004
Describing	.005	.26	.61	-.005	.003	.15	.70	.01
Non-Judging	.01	.35	.56	.01	.005	.25	.62	.01
Depression Anxiety Stress Scales-21								
Depression	.07	4.07	.05*	-.04	< .001	< .001	.98	< .001
Anxiety	.02	.84	.36	-.02	.09	4.83	.03*	-.07
Stress	.02	1.17	.29	-.03	.01	.35	.56	-.03

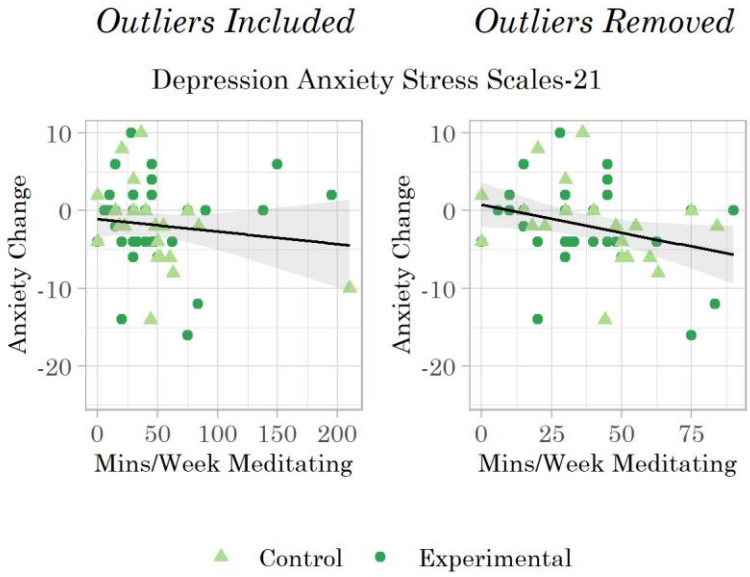
Note. Experimental change was calculated as Time 2 – Time 1. Control change was calculated as Time 3 – Time 2. [a]$df = 1, 53$. [b]$df = 1, 49$. *$p \leq .05$.

Figure 3.6. The Mindful Grad Student — Modified Intention-to-Treat Moderations: Changes in observing, depression, and anxiety as a function of time spent meditating during the intervention.



(Continued on the next page.)

(Figure 3.6 continued.)



Note. Figures depict the moderating relationship between minutes per week spent meditating during the intervention and changes in scores on the observing subscale of the Five Facet Mindfulness Questionnaire-24, and the depression and anxiety subscales of the Depression Anxiety Stress Scales-21 both before (left) and after (right) outlier removal. For participants in the control condition (light green/grey triangles), change was calculated as T3 – T2. For participants in the experimental condition (dark green/grey circles), change was calculated as T2 – T1. The shaded area represents a 95% confidence region.

was not significant (see Figure 3.7); $R^2 = .07$, $F(1, 49) = 3.94$, $p = .05$,[32] $B = -.04$. All other results from PP analyses were found to be comparable to the results from mITT analyses.

3.4 Discussion

With respect to T2 comparisons, mITT and PP analyses were generally consistent. Both sets of analyses revealed that, at T2, participants in the experimental condition had higher levels of non-reactivity, observing, and non-judging than participants in the waitlist control condition and less severe symptoms of depression. T2 differences regarding awareness, perceived stress, negative affect, and stress severity were additionally noted, though effects involving these outcomes seem to have been dependent on participants' pre-intervention states. Specifically, experimental participants displayed higher levels of T2 awareness than waitlist control participants but only in participant subgroups characterized by low to moderate pre-intervention levels of awareness. Similarly, experimental participants were found to have lower T2 levels of perceived stress, negative affect, and stress severity than waitlist control participants when T1 levels of these factors were moderate to high. The MBI, therefore, seems to be capable of inducing a broad range of effects, including enhanced non-reactivity, observing, non-judging, and awareness; reduced perceptions of stress; and decreases in negative affect and the severity of symptoms associated with both depression and stress. The intervention's ability to evoke change in awareness, perceived stress, negative affect, and stress severity, however, may be limited to those who, at the beginning of the program, report substantial room for improvement in these areas.

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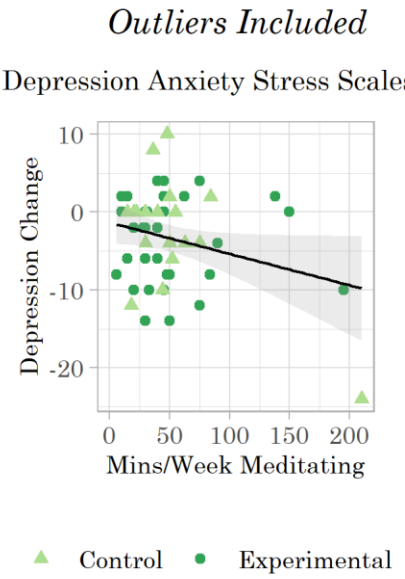
[32]This number has been rounded to two decimal places but is, in fact, > .05.

Figure 3.7. The Mindful Grad Student — Per-Protocol Moderations: Changes in depression as a function of time spent meditating during the intervention.



Note. The figure depicts the moderating relationship between minutes per week spent meditating during the intervention and changes in scores on the depression subscale of the Depression Anxiety Stress Scales-21 before outlier removal. For participants in the control condition (light green/grey triangles), change was calculated as T3 – T2. For participants in the experimental condition (dark green/grey circles), change was calculated as T2 – T1. The shaded area represents a 95% confidence region.

Participant drop-out during this study — which was high across all time points — seems to have been related primarily to condition. In particular, attrition between T1 and T2 was found to be significantly higher in the experimental condition than in the waitlist control condition. As T2 marked the end of the intervention for the experimental participants, those in the experimental condition may have been less inclined to respond to the T2 assessment than those in the waitlist control condition due to a decrease in perceived obligation towards study participation following intervention completion; this may also explain the high rate of T2 to T3 attrition among participants in the control condition, which analyses suggest was otherwise unrelated to any of the participant characteristics that were assessed.

Results from T2 and T3 comparisons should be interpreted with caution due to the small sample of participants considered in these analyses and the lack of an appropriate comparison group. Nevertheless, participants in the waitlist control condition displayed significant increases in positive affect, non-reactivity, describing and non-judging, as well as decreases in perceived stress, negative affect and the severity of stress-related symptoms post-intervention. Changes in positive affect, non-reactivity, and stress severity, however, were only found to be significant in mITT analyses. PP analyses — which found no significant T2 to T3 changes on these outcomes — excluded two participants who did not meditate throughout the program and one who indicated that they were actively participating in another MBI during the study. As time spent meditating during the intervention was not a significant moderator of changes in scores on the positive affect subscale of the PANAS, the non-reactivity subscale of the FFMQ-24, or the stress subscale of the DASS-21, it seems unlikely that results related to these measures would have been influenced by the inclusion or exclusion of individuals who failed to meditate during the intervention. The exclusion of a participant who was involved in another MBI, however, could have impacted PP results if this

extraneous intervention was responsible for amplifying outcomes in this study. Ultimately though, none of the control participants who were excluded from PP analyses displayed exceptionally large[33] shifts in positive affect, non-reactivity, or stress severity so it is unclear why the removal of these specific individuals would diminish the overall significance of any corresponding test.

The aforementioned discrepancy between mITT and PP analyses might simply be the consequence of reducing an already small sample to an even smaller sub-sample. A difference in sample size and/or the use of different analysis techniques (i.e., the use of between-group tests to assess changes in the experimental group vs. the use of within-group tests to measure changes in the waitlist control group) might also explain why control and experimental participants seem to have experienced different outcomes during the study; this suggestion seems particularly likely given that supplementary analyses (presented in Appendix N) found no significant differences in participant characteristics or pre-intervention scores that might otherwise account for the condition-specific variations that were observed in study outcomes. Moderation analyses further imply that outcomes in general were unrelated to previous meditation experience. Intervention participation, however, was found to be positively related to changes in observing and negatively related to changes in depression severity, though both of these relationships were only significant prior to outlier removal and the relationship between participation and depression severity was not significant in PP analyses. Time spent meditating, therefore, seems to be predictive of fluctuations in observing and depression severity only when extreme amounts of meditation — including no meditation in the

[33]None of the three participants displayed a change in positive affect, non-reactivity, or stress severity that was large enough to be classified as an outlier in the sample of waitlist control participants included in the T2 and T3 comparison analyses.

case of depression — are taken into consideration (i.e., participation is not a significant moderator of change among moderately active meditators; a notable increase in the magnitude of change is only apparent when comparing non-meditators to meditators and moderate meditators to exceedingly active meditators). Greater engagement was also found to predict greater decreases in the severity of symptoms associated with anxiety but only after outlier removal, implying that there is an amount of meditation beyond which further meditation-induced improvements are unlikely.

The significant relationship between program engagement and changes in scores on the anxiety subscale of the DASS-21 is interesting given that significant changes in the severity of anxiety symptoms were not observed throughout the study.[34] Changes on other measures — including the stress subscale of the DASS-21 — appear to have been contingent on participants' pre-intervention states. It is possible, therefore, that participants' anxiety symptoms were not severe enough for program-induced decreases in anxiety to occur; in fact, mean pre-intervention anxiety scores for both conditions were close to the DASS-21 "normal" range of 0–7 (for the experimental condition, $M_{T1} = 7.59$ and, for the control condition, $M_{T2} = 9.24$).[35] However, the intervention had a significant effect on experimental depression symptoms despite experimental T1 scores on the depression subscale also being close to the "normal" range of 0–9 ($M = 10.41$). The intervention, therefore, seems to be primarily effective in improving mood, reducing stress, and enhancing aspects of trait mindfulness rather than reducing the severity of anxiety-related symptoms.

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[34]A similar outcome was noted and discussed in Chapter 2, Study 2 (i.e., Section 2.3.3)

[35]These values are representative of the experimental and waitlist control participants included in T2 comparisons and T2 and T3 comparisons, respectively.

Chapter 4

4 General Discussion

This dissertation adds to a growing body of literature that suggests that the practice of mindfulness can improve mood and well-being. The following discussion provides a summary of the major findings from the conducted studies and outlines some of the relevant limitations and implications of this work.

4.1 The Studies, Summarized

4.1.1 The Mindful Lawyer Study 1

In Chapter 2, Study 1, a group of legal professionals participated in the Anxious Lawyer mindfulness program — an 8-week MBI consisting of readings, informal mindfulness activities, and online meditations. At the end of the program, participants reported significant increases in positive affect, psychological resilience, and aspects of trait mindfulness (i.e., non-judging, observing, awareness, describing, and non-reactivity), as well as decreases in perceived stress; negative affect; and the severity of symptoms associated with depression, anxiety, and stress. Moderation analyses further suggested that outcomes were unrelated to the number of minutes that participants spent meditating per week but that changes in positive affect were smaller for those with considerable meditation experience compared to those with little or no experience.

4.1.2 The Mindful Lawyer Study 2

In a second study (i.e., Chapter 2, Study 2), lawyers participated in a 30-day intervention called Mindful Pause, which is comprised of daily emails and online, guided meditations. Compared to a waitlist control group, experimental participants displayed lower T2 levels of perceived stress and negative affect; less severe symptoms of stress; higher levels of positive affect

and observing; and, for those who actively meditated during the program, greater non-reactivity. Lawyers in the waitlist control condition also displayed significant increases in non-judging and reductions in perceived stress and negative affect following program participation. In moderation analyses, participation was observed to be positively related to changes in non-judging and those who meditated extensively during the intervention experienced larger decreases in perceived stress than those who meditated very little or not at all. Degree of program participation was further predictive of changes in the severity of stress and anxiety symptoms, though improvements appeared to plateau at a certain point. Additionally, many outcomes seem to have been influenced by pre-intervention levels of awareness, with higher levels of awareness being associated with smaller fluctuations in positive affect, resilience, observing, awareness, perceived stress, and depression and stress severity.

4.1.3 The Mindful Grad Student Study

Finally, in Chapter 3, graduate and professional students took part in a 4-week MBI adapted from the intervention in Chapter 2, Study 1. Compared to a waitlist control group, students assigned to complete the program reported less severe symptoms of depression at T2 and higher levels of non-reactivity, observing, and non-judging; comparative improvements regarding awareness, perceived stress, negative affect, and stress severity were additionally noted among those who began the study with particularly low (awareness) or high (perceived stress, negative affect, and stress severity) levels of these factors. Similar changes were observed among waitlist control participants who experienced post-intervention decreases in perceived stress and negative affect and increases in describing and non-judging; favourable changes regarding positive affect, non-reactivity, and stress severity were also observed among waitlist control participants but only when non-compliant participants were included (i.e., in mITT analyses). Based on moderation

analyses, intervention participation seems to have been positively predictive of increases in observing and decreases in depression severity but only when considered in the context of extreme amounts of meditation (among moderate meditators, these relationships were non-significant); greater engagement further predicted greater decreases in anxiety severity but there appears to have been a maximally helpful amount of meditation beyond which improvements plateaued.

4.2 Contrasts and Comparisons

To further summarize Section 4.1 above:

(1) the Anxious Lawyer program in Chapter 2, Study 1 was found to be associated with changes on all of the measures considered and all outcomes in this study were replicated across mITT and PP analyses;

(2) the Mindful Pause program in Chapter 2, Study 2 largely impacted stress and mood and enhanced three of the five aspects of trait mindfulness; and

(3) the adapted Anxious Lawyer program in Chapter 3 evoked changes on all measures but the BRS and the anxiety subscale of the DASS-21. Though many outcomes — namely, changes in perceived stress, negative affect, awareness, and stress severity — were seemingly dependent on participants' pre-intervention states, the nature of these contingencies was logical in that participants who initially scored especially low or high on the relevant measures reported significant increases or decreases, respectively.

The Anxious Lawyer program in Chapter 2, Study 1 seems to have been the most widely impactful, followed by the adapted Anxious Lawyer program in Chapter 3 and, finally, the Mindful Pause program in Chapter 2, Study 2.

Outcome discrepancies across the three studies are undoubtedly related to pre-existing population differences to some extent (i.e., differences in the pre-intervention states of each group of participants and/or stressors inherent to the work of legal professionals vs. graduate students). Additionally, however, discrepancies may be attributed to variations in the length and content of each of the interventions and the analytic strategies employed in each study.

4.2.1 Intervention Lengths

Mindfulness has been proposed to act via a combination of mechanisms, including exposure, cognitive change, self-management, relaxation, and acceptance (see Figure 1.5). Like many other skills, however, mindfulness is cultivated gradually (Gunaratana, 2011). For those just starting a mindfulness meditation practice, therefore, perhaps one of the first mechanisms to be initiated is relaxation, which research suggests can be invoked neurophysiologically by simple meditation techniques (Lazar et al., 2000). Cognitive reappraisal, enduring changes to emotional reactivity, and sweeping alterations to an individual's level of trait mindfulness, on the other hand, presumably take longer to evolve as one's mindfulness abilities develop over time. As a result, programs like Mindful Pause and the Anxious Lawyer adaptation are likely restricted in the scope of outcomes that they are capable of promoting due to their limited durations of 30 days and 4 weeks long, respectively. This may explain why the 8-week Anxious Lawyer program was the only intervention found to be associated with improvements on all of the measures considered. Mindful Pause and the Anxious Lawyer adaptation, in comparison, seem to have largely impacted factors that might benefit from enhanced awareness and relaxation (e.g., reductions in stress and improvements in mood); changes on the five aspects of trait mindfulness were also inconsistent in these two program, with Mindful Pause demonstrating no effect on awareness or describing and the Anxious Lawyer adaptation

producing inconsistent trait mindfulness-related outcomes across participant subgroups.

4.2.2 Intervention Content

Though the three interventions varied widely with respect to content, two major points of distinction are the inclusion or exclusion of didactic material and suggestions for off-the-mat mindfulness activities. Both of these features were included in the Anxious Lawyer program, which was the most comprehensive of the three interventions, involving guided meditations, informal mindfulness activities, and a book that presents both general explanations of topics related to mindfulness and specific examples of how mindfulness can be applied within the context of the legal profession. Its apparent ability to produce improvements in a variety of areas is likely related to its detailed text, which provides a thorough introduction to the topic of mindfulness, and its use of population-directed examples and informal exercises, both of which encourage participants to adopt a mindful approach to living that extends beyond meditation.

The Anxious Lawyer adaptation maintained the general structure of the standard Anxious Lawyer program but covered comparatively fewer topics with less detail and specificity. Readings from the adapted program focused on mindfulness and meditation and the ways in which a mindfulness practice might help to mitigate stress, enhance mood, clarify the nature of one's thoughts, and improve the quality of one's relationships with both others and the self. These topics were drawn from *The Anxious Lawyer* (i.e., the book from the Anxious Lawyer program; Cho & Gifford, 2016) and were also covered in the original Anxious Lawyer program. Additionally, however, *The Anxious Lawyer* provides explicit discussion of resiliency and anxiety, neither of which were covered in the adapted readings, which may explain why changes in BRS and DASS-21 anxiety scores were observed in Chapter 2,

Study 1 but not in Chapter 3.[36] Furthermore, the material in the adapted program was non-specific to the participant population and included very few suggestions for informal mindfulness activities. The adapted program, therefore, was presumably less conducive to the development of general, non-meditative-based mindfulness skills than the original Anxious Lawyer intervention. The relatively superficial nature of the adapted program may explain why some outcomes in Chapter 3 were inconsistent across participant subgroups; had the intervention been more comprehensive in nature, improvements in stress, negative affect, and awareness may have been reported by more than those who began the program with substantial room for improvement in these areas.

The least involved of the three programs was Mindful Pause, which was almost solely meditation-based and included minimal material designed to educate participants on mindfulness and few informal mindfulness activities. In fact, Mindful Pause may be more appropriately described as a meditation-based program than as a MBI. Nevertheless, meditation has long been linked to relaxation and stress reduction (e.g., Benson & Klipper, 1975; Morse et al., 1977). It is, therefore, unsurprising that the Mindful Pause program was found to decrease stress and improve mood. Without accompanying didactic material and suggestions for informal mindfulness applications, however, Mindful Pause seems to have been incapable of bringing about changes in other areas, such as resilience and depression and anxiety severity. Mindful Pause also failed to evoke changes in all areas of trait mindfulness, perhaps because it was limited in its capacity to encourage the development of certain mindfulness skills. For instance, whereas mindfulness-based meditations

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[36]Changes in DASS-21 depression scores were observed in Chapter 3 despite readings from the adapted program making no specific mention of depression. The intervention did, however, discuss mood and the process of challenging negative self-thought, both of which are measured by the depression subscale of the DASS-21 (Lovibond & Lovibond, 1995).

may emphasize observing, non-reactivity, and non-judging — the three skills that were found to be enhanced by Mindful Pause — informal mindfulness activities would likely be particularly helpful for fostering an ability to act with awareness; this conclusion is broadly supported by research suggesting that, of the five aspects of trait mindfulness measured by the FFMQ, awareness and describing are the least correlated with meditation experience (Baer et al., 2008), implying that meditation alone is not always sufficient for evoking changes in these specific areas.

4.2.3 Analytic Strategies

The Anxious Lawyer program seems to have been the most effective of the three interventions as it produced the broadest and most consistent range of results. One might feel particularly justified in making this assumption because the Anxious Lawyer was also the longest and most comprehensive of the programs. Though this conclusion may well be true, however, it should be noted that Chapter 2, Study 1 relied primarily on within-group comparisons and did not include a control condition. Consequently, although participants in this study seem to have improved over time, changes cannot be ascribed to the Anxious Lawyer program definitively.[37] Both Chapter 2, Study 2 and the study in Chapter 3, on the other hand, included control groups and implemented between-group comparisons to isolate the effects that could be attributed to each of the interventions; that these studies were characterized by less significance than Chapter 2, Study 1 is, therefore, unsurprising since

[37]It is, perhaps, worth mentioning that the Anxious Lawyer program was conducted during the 2016 US presidential election and that some participants expressed concern that their survey responses would reflect the stress and anxiety that they felt surrounding this event. The fact that significant decreases in stress, anxiety, and negative affect were reported despite these worries suggests that the intervention did, in fact, have some tangible impact on participants' well-being.

they employed relatively stronger experimental designs and more stringent forms of statistical tests.

4.3 Limitations and Future Directions

The lack of a control group is a clear limitation of Chapter 2, Study 1 which necessitates that results associated with the Anxious Lawyer program be interpreted with caution. Outcomes in the other two studies — particularly those experienced by participants in the experimental condition[38] — can be more readily ascribed to the Mindful Pause and adapted Anxious Lawyer programs due to their use of random assignment and the inclusion of a waitlist control group. A stronger and more interesting design would have also involved an active control condition. Contrasting each of the programs with an alternative task, such as reading or relaxation training, would further elucidate whether changes displayed by participants were due to the practice of mindfulness or mere relaxation — a common by-product of meditation (Benson & Klipper, 1975; Lazar et al., 2000; Morse et al., 1977), which was a primary feature in each of the programs considered.

In using both mITT and PP analyses, this dissertation sought to provide a more accurate assessment of the external validity of the three interventions. Whereas PP analyses highlight the maximal efficacy of an intervention, intention-to-treat analyses are more representative of the outcomes that can be realistically expected with program administration (Ranganathan et al., 2016). By including all participants, intention-to-treat approaches also maintain random assignment and mitigate some of the bias that can be

[38]Chapter 2, Study 2 and Chapter 3 also employed within-subject comparisons to assess changes reported by participants in the waitlist control condition. These analyses are valuable in that they provide insight into the experience of control participants during the study; without a suitable comparison group, however, these results are subject to the same limitations as the results from Chapter 2, Study 1 and should be interpreted with caution.

introduced when selecting subsets of participants for PP analyses. This dissertation, however, employed a mITT approach, whereby non-compliant participants were included in analyses but missing data was not imputed. Demographic assessments of participants included in between-group comparisons in Chapter 2, Study 2 and Chapter 3 found no systematic differences between conditions, implying that random assignment was maintained in these sub-samples to some extent. Nevertheless, it would be incorrect to state that the mITT analyses in this dissertation provide a complete and authentic estimate of the external validity of the interventions, especially since most of the samples included in mITT analyses differed from the samples in PP analyses by only a few participants. Instead, results should be interpreted as a suggestion of the changes that each intervention is capable of inducing and future studies should examine the Anxious Lawyer programs and Mindful Pause using a more stringent intention-to-treat approach; in the meantime, groups and organizations who are interested in administering the interventions should be aware that outcomes may differ from those reported in this dissertation.

The rationale as to why a standard intention-to-treat approach was not adopted for this dissertation is outlined in Section 1.8. One of the primary reasons for using a modified method, however, was that imputation of missing data would have resulted in a large amount of estimation due to the high rates of participant attrition observed in each study. Reported rates of study attrition are likely inflated compared to program attrition as participants were not required to respond to the assessments in order to participate in the interventions. In general though, the rates of attrition observed in these studies are broadly consistent with what has been observed in other studies of online interventions (Christensen et al., 2009) and MBIs (e.g., Cavanagh et al., 2013; Economides et al., 2018; Howells et al., 2016; Nadler et al., 2020).

Compared to in-class programs, internet-based approaches tend to be less costly to administer (Hedman et al., 2011) and are often easier to integrate into a busy work day because they require less large-scale organization and are typically less time consuming to participate in (Andersson & Titov, 2014). Online mediums, however, may be seen as offering less peer support or engagement than an in-person course, leading participants to feel less enthusiasm or accountability towards completing them. Busy individuals may also be quick to forget a self-scheduled activity or find it difficult to prioritize a personal mindfulness practice in the face of important work-related tasks. Consequently, future studies involving online methodology should consider ways to encourage regular participation. For example, online message boards or instant messaging platforms may help to facilitate a feeling of community and obligation. Forgetfulness, on the other hand, could be mitigated via digital calendars programmed with daily self-identified practice times coupled with email or app-based notifications.

Aside from increased rates of attrition, online platforms present challenges with respect to the types of data that can be collected. The studies in this dissertation, for instance, relied solely on self-report data and, though it is clearly valuable to know whether an individual subjectively feels more positive or less stressed, self-reports are susceptible to response bias and demand characteristics. Self-selection may also have occurred as participants were aware that each study was related to mindfulness. Issues of bias and self-selection limit the generalizability of results from this dissertation because individuals with an interest in mindfulness may have been over-sampled and participants who possessed an expectation that mindfulness would improve their well-being may have adjusted their responses — consciously or not — to reflect their beliefs.

Beliefs and expectations likely play an important role in the outcomes achieved through mindfulness. In fact, *expectation of relief*, which is intended

to purposefully enhance the placebo effect, is listed as a key element of the MBSR program (Kabat-Zinn, 1982). It may, therefore, be important for future research to employ measures like the Meditation Intentions Questionnaire (Kharlas, 2018) so that participant expectations can be taken into consideration when assessing mindfulness-related outcomes. Researchers looking to minimize potential sources of error and to isolate mindfulness-specific effects may also wish to consider forms of measurement that do not rely on self-report, such as external ratings, heart rate variability, and cortisol levels. Neurophysiological techniques, in particular, will be especially important for helping to clarify the neurological underpinnings of mindfulness practice and for progressing beyond the question of *what* can mindfulness do to *how* does mindfulness do what it does.

4.4 A Final Word of Caution and Advice

Despite accounts — both scientific and anecdotal — that mindfulness promotes and supports healthy and adaptive functioning, evidence suggests that its effects are not always positive. Mindfulness may, for instance, provoke or aggravate symptoms in a variety of clinical conditions. Most obvious, perhaps, is the risk of pain and stiffness associated with sitting for extended periods of time during meditation. Though dedicated practitioners are often taught to accept pain as part of their practice (Kornfield, 1977), immobility can be detrimental for those suffering with arthritis (Arthritis Society, n.d.). As a result, individuals with arthritis who are interested in building a mindfulness practice may wish to consider low-impact off-the-mat practices, such as mindful walking (Lustyk et al., 2009). Caution should also be used by those with epilepsy, as meditation-induced changes in neurophysiological processes can lower seizure thresholds (Jaseja, 2005).

In addition to adverse physiological outcomes, mindfulness-related psychological disturbances have been reported, including psychosis,

detachment, and feelings of depersonalization (Lustyk et al., 2009). It is worth noting that severe issues seem to be associated primarily with lengthy retreats as opposed to single-session inductions or MBIs. Even evidence-based programs, however, possess limitations. For example, although MBCT has been found to be effective at reducing relapse risk for individuals with three or more prior episodes of depression, participation in the program has been associated with a nonsignificant increase in relapse risk for those with only two prior episodes (Ma & Teasdale, 2004; Teasdale et al., 2000). Specific techniques may also be problematic if applied improperly or in the absence of therapeutic support. Receptive awareness, for instance, could prompt flashbacks and re-traumatization among individuals with PTSD (Lustyk et al., 2009) and mindful eating exercises could be triggering for those with a history of disordered eating.

Though potentially not as serious as the clinical risks discussed above, unintended cognitive side effects to mindfulness have been observed. Specifically, B. M. Wilson et al. (2015) found that a 15-minute mindfulness induction increased false memory susceptibility in a Deese-Roediger-McDermott paradigm relative to mind-wandering. The authors proposed that this effect was due to a decrease in source monitoring ability, whereby the nonjudgmental awareness evoked by mindfulness prevented participants from determining whether a word had been perceived externally or generated internally. Work by Creswell et al. (2014) and D. R. Evans and Eisenlohr-Moul (2014) also suggests that self-regulatory abilities are taxed by preliminary engagement in a mindfulness practice; this is likely, however, an inevitable by-product of learning a new, attention-demanding activity and provides support for the view that mindfulness is a challenging skill to master (Gunaratana, 2011).

The findings discussed in this section imply that all individuals may not benefit equally from all types of mindfulness exercises. As a result,

individuals seeking to adopt a mindfulness practice should carefully consider what they would like to achieve and whether or not their chosen technique or program aligns with their personal goals and intentions. It may also be advisable for some to discuss their plans with a mindfulness trainer and/or medical professional so that practices can be customized based on desired objectives and current conditions and predispositions and potential issues can be avoided, minimized, or addressed as they arise.

4.5 Conclusion

Legal professionals and graduate students are struggling with high rates of depression, anxiety, and stress (T. M. Evans et al., 2018; Krill et al., 2016; Organ et al., 2016). Both groups would likely benefit from a greater awareness and acceptance of mental health in general and of the challenges faced in each community specifically. Research also suggests, however, that awareness, although necessary, is not enough. The Graduate Assembly (2014), for instance, notes that many students fail to receive adequate sleep, even though the benefits of sleep are widely known and despite the fact that sleep is a top predictor for depression among students. Consequently, universities and organizations must do more to encourage help-seeking and to actively promote and enhance accessibility to health and wellness resources. Mindfulness training is one such resource that is particularly deserving of consideration — not only has it been linked to a plethora of positive outcomes (e.g., Brown et al., 2007) but it is also incredibly versatile and can be practiced essentially anywhere and at any time. The studies in this dissertation further suggest that mindfulness and meditation-based interventions can be effectively administered online, facilitating cost-efficiency and flexibility (though in-person programs may be best for encouraging adherence). Additional research is necessary to clarify mechanisms of action and to identify which effects can be attributed to mindfulness specifically vs. relaxation alone. Nevertheless, MBIs appear to

be effective for improving health and wellness among both legal professionals and graduate students alike and even the simple act of brief daily meditation seems to have the potential to reduce stress and boost mood. For those looking to enhance well-being, improve clarity and attention, or simply gain a greater awareness and understanding of the self, therefore, mindfulness may be worthy of exploration.

References

Academy for Mindfulness and Contemplative Studies. (n.d.). *Other sites on mindfulness*. Academy for Mindfulness and Contemplative Studies | University of Ottawa. Retrieved February 12, 2020, from https://www.uottawa.ca/mindfulness/resources

Agnew, H. (2014, May 4). "Mindfulness" gives stressed-out bankers something to think about. *Financial Times*. https://www.ft.com/content/331b85d0-d20d-11e3-8b5b-00144feabdc0

Aikens, K. A., Astin, J., Pelletier, K. R., Levanovich, K., Baase, C. M., Park, Y. Y., & Bodnar, C. M. (2014). Mindfulness goes to work: Impact of an online workplace intervention. *Journal of Occupational and Environmental Medicine*, *56*(7), 721–731. https://doi.org/10.1097/JOM.0000000000000209

Allen, H. K., Barrall, A. L., Beck, K. H., Vincent, K. B., & Arria, A. M. (2020). Situational context and motives of alcohol use among graduate student drinkers. *Addictive Behaviors*, *104*, Article 106267. https://doi.org/10.1016/j.addbeh.2019.106267

Allen, H. K., Lilly, F., Green, K. M., Zanjani, F., Vincent, K. B., & Arria, A. M. (2020). Substance use and mental health problems among graduate students: Individual and program-level correlates. *Journal of American College Health*. https://doi.org/10.1080/07448481.2020.1725020

Allen, T. D., & Kiburz, K. M. (2012). Trait mindfulness and work–family balance among working parents: The mediating effects of vitality and sleep quality. *Journal of Vocational Behavior*, *80*(2), 372–379. https://doi.org/10.1016/j.jvb.2011.09.002

American Bar Association. (2019, May 9). *Wellness, mindfulness, work-life balance*. Retrieved June 6, 2019, from https://www.americanbar.org/groups/lawyer_assistance/resources/lawyer_wellness/

American College Health Association. (2019). *American College Health Association–National College Health Assessment II. Graduate & professional student reference group: Executive summary. Spring 2019*. https://www.acha.org/documents/ncha/NCHA-II_SPRING_2019_GRADUATE_AND_PROFESSIONAL_REFERENCE_GROUP_EXECUTIVE_SUMMARY.pdf

Andersson, G., & Titov, N. (2014). Advantages and limitations of internet-based interventions for common mental disorders. *World Psychiatry*, *13*(1), 4–11. https://doi.org/10.1002/wps.20083

Anonymous Academic. (2016, January 22). Why do academics drink so much? *The Guardian*. https://www.theguardian.com/higher-education-network/2016/jan/22/why-do-academics-drink-so-much

Anxiety and Depression Association of America. (n.d.). *Facts & statistics*. Retrieved March 30, 2020, from https://adaa.org/about-adaa/press-room/facts-statistics

Arch, J. J., & Craske, M. G. (2006). Mechanisms of mindfulness: Emotion regulation following a focused breathing induction. *Behaviour Research and Therapy*, *44*(12), 1849–1858. https://doi.org/10.1016/j.brat.2005.12.007

Arnsten, A. F. T. (2009). Stress signalling pathways that impair prefrontal cortex structure and function. *Nature Reviews Neuroscience*, *10*(6), 410–422. https://doi.org/10.1038/nrn2648

Arthritis Society. (n.d.). *Pain Management*. Retrieved February 1, 2020, from https://arthritis.ca/treatment/pain-management

Auguie, B. (2017). *gridExtra: Miscellaneous functions for "grid" graphics* (Version 2.3). https://CRAN.R-project.org/package=gridExtra

Baer, R. A. (2006). Mindfulness training as a clinical intervention: A conceptual and empirical review. *Clinical Psychology: Science and Practice, 10*(2), 125–143. https://doi.org/10.1093/clipsy/bpg015

Baer, R. A., Smith, G. T., & Allen, K. B. (2004). Assessment of mindfulness by self-report: The Kentucky Inventory of Mindfulness Skills. *Assessment*, *11*(3), 191–206. https://doi.org/10.1177/1073191104268029

Baer, R. A., Smith, G. T., Hopkins, J., Krietemeyer, J., & Toney, L. (2006). Using self-report assessment methods to explore facets of mindfulness. *Assessment*, *13*(1), 27–45. https://doi.org/10.1177/1073191105283504

Baer, R. A., Smith, G. T., Lykins, E., Button, D., Krietemeyer, J., Sauer, S., Walsh, E., Duggan, D., & Williams, J. M. G. (2008). Construct validity of the five facet mindfulness questionnaire in meditating and nonmeditating samples. *Assessment*, *15*(3), 329–342. https://doi.org/10.1177/1073191107313003

Baer, R., & Nagy, L. M. (2017). Professional ethics and personal values in mindfulness-based programs: A secular psychological perspective. In L. M. Monteiro, J. F. Compson, & F. Musten (Eds.), *Practitioner's guide to ethics and mindfulness-based interventions* (pp. 87–111). Springer International Publishing. https://doi.org/10.1007/978-3-319-64924-5_4

Baltzell, A., & Akhtar, V. L. (2014). Mindfulness meditation training for sport (MMTS) intervention: Impact of MMTS with division I female athletes. *The Journal of Happiness & Well-Being*, *2*(2), 160–173. https://pdfs.semanticscholar.org/a272/5f50164db03d701f9eba6fed07f9f9480034.pdf

Bamber, M. D., & Kraenzle Schneider, J. (2016). Mindfulness-based meditation to decrease stress and anxiety in college students: A narrative synthesis of the research. *Educational Research Review*, *18*, 1–32. https://doi.org/10.1016/j.edurev.2015.12.004

Banks, K., Newman, E., & Saleem, J. (2015). An overview of the research on mindfulness-based interventions for treating symptoms of posttraumatic stress disorder: A systematic review. *Journal of Clinical Psychology*, *71*(10), 935–963. https://doi.org/10.1002/jclp.22200

Barbosa, P., Raymond, G., Zlotnick, C., Wilk, J., Toomey, R., III, & Mitchell, J., III. (2013). Mindfulness-based stress reduction training is associated with greater empathy and reduced anxiety for graduate healthcare students. *Education for Health*, *26*(1), 9–14. https://doi.org/10.4103/1357-6283.112794

Barry, K. M., Woods, M., Martin, A., Stirling, C., & Warnecke, E. (2019). A randomized controlled trial of the effects of mindfulness practice on doctoral candidate psychological status. *Journal of American College Health*, *67*(4), 299–307. https://doi.org/10.1080/07448481.2018.1515760

Beach, M. C., Roter, D., Korthuis, P. T., Epstein, R. M., Sharp, V., Ratanawongsa, N., Cohn, J., Eggly, S., Sankar, A., Moore, R. D., & Saha, S. (2013). A multicenter study of physician mindfulness and health care quality. *Annals of Family Medicine*, *11*(5), 421–428. https://doi.org/10.1370/afm.1507

Benjamin, G. A. H., Darling, E. J., & Sales, B. (1990). The prevalence of depression, alcohol abuse, and cocaine abuse among United States lawyers. *International Journal of Law and Psychiatry*, *13*(3), 233–246. https://doi.org/10.1016/0160-2527(90)90019-y

Benjamin, G. A. H., Kaszniak, A., Sales, B., & Shanfield, S. B. (1986). The role of legal education in producing psychological distress among law students and lawyers. *American Bar Foundation Research Journal*, *11*(2), 225–252. https://doi.org/10.1111/j.1747-4469.1986.tb00240.x

Bennike, I. H., Wieghorst, A., & Kirk, U. (2017). Online-based mindfulness training reduces behavioral markers of mind wandering. *Journal of Cognitive Enhancement*, *1*(2), 172–181. https://doi.org/10.1007/s41465-017-0020-9

Benson, H., & Klipper, M. Z. (1975). *The relaxation response*. William Morrow and Company, Inc.

Bergen-Cico, D., Possemato, K., & Cheon, S. (2013). Examining the efficacy of a brief mindfulness-based stress reduction (brief MBSR) program on psychological health. *Journal of American College Health*, *61*(6), 348–360. https://doi.org/10.1080/07448481.2013.813853

Bishop, S. R. (2002). What do we really know about mindfulness-based stress reduction? *Psychosomatic Medicine*, *64*(1), 71–83. https://doi.org/10.1097/00006842-200201000-00010

Bishop, S. R., Lau, M., Shapiro, S., Carlson, L., Anderson, N. D., Carmody, J., Segal, Z. V., Abbey, S., Speca, M., Velting, D., & Devins, G. (2004). Mindfulness: A proposed operational definition. *Clinical Psychology: Science and Practice*, *11*(3), 230–241. https://doi.org/10.1093/clipsy/bph077

Bodenlos, J. S., Noonan, M., & Wells, S. Y. (2013). Mindfulness and alcohol problems in college students: The mediating effects of stress. *Journal of American College Health*, *61*(6), 371–378. https://doi.org/10.1080/07448481.2013.805714

Bohlmeijer, E., ten Klooster, P. M., Fledderus, M., Veehof, M., & Baer, R. (2011). Psychometric properties of the Five Facet Mindfulness Questionnaire in depressed adults and development of a short form. *Assessment*, *18*(3), 308–320. https://doi.org/10.1177/1073191111408231

Bowen, S., Chawla, N., & Marlatt, G. A. (2011). *Mindfulness-based relapse prevention for addictive behaviors: A clinician's guide*. Guilford Press.

Bowen, S., Witkiewitz, K., Clifasefi, S. L., Grow, J., Chawla, N., Hsu, S. H., Carroll, H. A., Harrop, E., Collins, S. E., Lustyk, M. K., & Larimer, M. E. (2014). Relative efficacy of mindfulness-based relapse prevention, standard relapse prevention, and treatment as usual for substance use disorders: A randomized clinical trial. *The Journal of the American Medical Association: Psychiatry*, *71*(5), 547–556. https://doi.org/10.1001/jamapsychiatry.2013.4546

Boyce, B. (2010, August 26). The law of mindfulness. *Mindful*. https://www.mindful.org/the-law-of-mindfulness/

Boyd, J. H., & Weissman, M. M. (1981). Epidemiology of affective disorders. A reexamination and future directions. *Archives of General Psychiatry*,

38(9), 1039–1046. https://doi.org/10.1001/archpsyc.1981.01780340091011

Brefczynski-Lewis, J. A., Lutz, A., Schaefer, H. S., Levinson, D. B., & Davidson, R. J. (2007). Neural correlates of attentional expertise in long-term meditation practitioners. *Proceedings of the National Academy of Sciences of the United States of America*, *104*(27), 11483–11488. https://doi.org/10.1073/pnas.0606552104

Brewer, J. A., Mallik, S., Babuscio, T. A., Nich, C., Johnson, H. E., Deleone, C. M., Minnix-Cotton, C. A., Byrne, S. A., Kober, H., Weinstein, A. J., Carroll, K. M., & Rounsaville, B. J. (2011). Mindfulness training for smoking cessation: Results from a randomized controlled trial. *Drug and Alcohol Dependence*, *119*(1–2), 72–80. https://doi.org/10.1016/j.drugalcdep.2011.05.027

Broderick, P. C. (2005). Mindfulness and coping with dysphoric mood: Contrasts with rumination and distraction. *Cognitive Therapy and Research*, *29*(5), 501–510. https://doi.org/10.1007/s10608-005-3888-0

Brown, K. W., & Ryan, R. M. (2003). The benefits of being present: Mindfulness and its role in psychological well-being. *Journal of Personality and Social Psychology*, *84*(4), 822–848. https://doi.org/10.1037/0022-3514.84.4.822

Brown, K. W., Ryan, R. M., & Creswell, J. D. (2007). Mindfulness: Theoretical foundations and evidence for its salutary effects. *Psychological Inquiry*, *18*(4), 211–237. https://doi.org/10.1080/10478400701598298

Carsley, D., Khoury, B., & Heath, N. L. (2018). Effectiveness of mindfulness interventions for mental health in schools: A comprehensive meta-analysis. *Mindfulness*, *9*(3), 693–707. https://doi.org/10.1007/s12671-017-0839-2

Cavanagh, K., Churchard, A., O'Hanlon, P., Mundy, T., Votolato, P., Jones, F., Gu, J., & Strauss, C. (2018). A randomised controlled trial of a brief online mindfulness-based intervention in a non-clinical population: Replication and extension. *Mindfulness*, *9*(4), 1191–1205. https://doi.org/10.1007/s12671-017-0856-1

Cavanagh, K., Strauss, C., Cicconi, F., Griffiths, N., Wyper, A., & Jones, F. (2013). A randomised controlled trial of a brief online mindfulness-based intervention. *Behaviour Research and Therapy*, *51*(9), 573–578. https://doi.org/10.1016/j.brat.2013.06.003

Chan, D., & Woollacott, M. (2007). Effects of level of meditation experience on attentional focus: Is the efficiency of executive or orientation networks improved? *Journal of Alternative and Complementary Medicine*, *13*(6), 651–657. https://doi.org/10.1089/acm.2007.7022

Chang, W. (2014). *extrafont: Tools for using fonts* (Version 0.17). https://CRAN.R-project.org/package=extrafont

Cherkin, D. C., Anderson, M. L., Sherman, K. J., Balderson, B. H., Cook, A. J., Hansen, K. E., & Turner, J. A. (2017). Two-year follow-up of a randomized clinical trial of mindfulness-based stress reduction vs cognitive behavioral therapy or usual care for chronic low back pain. *The Journal of the American Medical Association*, *317*(6), 642–644. https://doi.org/10.1001/jama.2016.17814

Cherkin, D. C., Sherman, K. J., Balderson, B. H., Cook, A. J., Anderson, M. L., Hawkes, R. J., Hansen, K. E., & Turner, J. A. (2016). Effect of mindfulness-based stress reduction vs cognitive behavioral therapy or usual care on back pain and functional limitations in adults with chronic low back pain: A randomized clinical trial. *The Journal of the American Medical Association*, *315*(12), 1240–1249. https://doi.org/10.1001/jama.2016.2323

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. *Journal of Alternative and Complementary Medicine*, *15*(5), 593–600. https://doi.org/10.1089/acm.2008.0495

Cho, J., & Gifford, K. (2016). *The anxious lawyer: An 8-week guide to a joyful and satisfying law practice through mindfulness and meditation*. ABA Publishing.

Christensen, H., Griffiths, K. M., & Farrer, L. (2009). Adherence in internet interventions for anxiety and depression. *Journal of Medical Internet Research*, *11*(2), Article e13. https://doi.org/10.2196/jmir.1194

Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior*, *24*(4), 385–396. https://doi.org/10.2307/2136404

Confino, J. (2014, May 14). Google's head of mindfulness: "goodness is good for business." *The Guardian*. http://www.theguardian.com/sustainable-business/google-meditation-mindfulness-technology

Counter, R. (2016, November 24). Universities are teaching meditation to help students control stress. *Maclean's*. https://www.macleans.ca/education/universities-are-teaching-meditation-to-help-students-control-stress/

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

Creswell, J. D., Myers, H. F., Cole, S. W., & Irwin, M. R. (2009). Mindfulness meditation training effects on CD4+ T lymphocytes in HIV-1 infected adults: A small randomized controlled trial. *Brain, Behavior, and Immunity*, *23*(2), 184–188. https://doi.org/10.1016/j.bbi.2008.07.004

Creswell, J. D., Pacilio, L. E., Lindsay, E. K., & Brown, K. W. (2014). Brief mindfulness meditation training alters psychological and neuroendocrine responses to social evaluative stress. *Psychoneuroendocrinology*, *44*, 1–12. https://doi.org/10.1016/j.psyneuen.2014.02.007

Creswell, J. D., Way, B. M., Eisenberger, N. I., & Lieberman, M. D. (2007). Neural correlates of dispositional mindfulness during affect labeling. *Psychosomatic Medicine*, *69*(6), 560–565. https://doi.org/10.1097/PSY.0b013e3180f6171f

Cullen, M. (2011). Mindfulness-based interventions: An emerging phenomenon. *Mindfulness*, *2*(3), 186–193. https://doi.org/10.1007/s12671-011-0058-1

Dane, E., & Brummel, B. J. (2014). Examining workplace mindfulness and its relations to job performance and turnover intention. *Human Relations*, *67*(1), 105–128. https://doi.org/10.1177/0018726713487753

Davis, K. M., Lau, M. A., & Cairns, D. R. (2009). Development and preliminary validation of a trait version of the Toronto Mindfulness Scale. *Journal of Cognitive Psychotherapy*, *23*(3), 185–197. https://doi.org/10.1891/0889-8391.23.3.185

Davis, M. C., Zautra, A. J., Wolf, L. D., Tennen, H., & Yeung, E. W. (2015). Mindfulness and cognitive-behavioral interventions for chronic pain: Differential effects on daily pain reactivity and stress reactivity. *Journal of Consulting and Clinical Psychology*, *83*(1), 24–35. https://doi.org/10.1037/a0038200

DeBruine, L. (2018, March 28). *Plot comparison*. Lisa DeBruine: Rstats & Code & Stuff. https://debruine.github.io/posts/plot-comparison/

Doraisamy, J. (2015). *The wellness doctrines: For law students & young lawyers*. Xoum Publishing.

Duncan, L. G., & Bardacke, N. (2010). Mindfulness-based childbirth and parenting education: Promoting family mindfulness during the perinatal period. *Journal of Child and Family Studies*, *19*(2), 190–202. https://doi.org/10.1007/s10826-009-9313-7

Economides, M., Martman, J., Bell, M. J., & Sanderson, B. (2018). Improvements in stress, affect, and irritability following brief use of a mindfulness-based smartphone app: A randomized controlled trial. *Mindfulness*, *9*(5), 1584–1593. https://doi.org/10.1007/s12671-018-0905-4

Ellis, P. D. (2010). *The essential guide to effect sizes: Statistical power, meta-analysis, and the interpretation of research results*. Cambridge University Press.

Erogul, M., Singer, G., McIntyre, T., & Stefanov, D. G. (2014). Abridged mindfulness intervention to support wellness in first-year medical students. *Teaching and Learning in Medicine*, *26*(4), 350–356. https://doi.org/10.1080/10401334.2014.945025

Evans, D. R., & Eisenlohr-Moul, T. A. (2014). Self-regulatory deficits associated with unpracticed mindfulness strategies for coping with acute pain. *Journal of Applied Social Psychology*, *44*(1), 23–30. https://doi.org/10.1111/jasp.12196

Evans, T. M., Bira, L., Gastelum, J. B., Weiss, L. T., & Vanderford, N. L. (2018). Evidence for a mental health crisis in graduate education. *Nature Biotechnology*, *36*(3), 282–284. https://doi.org/10.1038/nbt.4089

Farb, N. (2019, November 13). *Be your own fMRI: Parallels between Buddhist psychology and cognitive neuroscience* [Colloquium talk]. Department of Psychology Colloquium Speaker Series. Western University, London, ON.

Felver, J. C., Celis-de Hoyos, C. E., Tezanos, K., & Singh, N. N. (2016). A systematic review of mindfulness-based interventions for youth in school settings. *Mindfulness*, *7*(1), 34–45. https://doi.org/10.1007/s12671-015-0389-4

Frank, J. L., Reibel, D., Broderick, P., Cantrell, T., & Metz, S. (2015). The effectiveness of mindfulness-based stress reduction on educator stress and well-being: Results from a pilot study. *Mindfulness*, *6*(2), 208–216. https://doi.org/10.1007/s12671-013-0246-2

Galante, J., Dufour, G., Vainre, M., Wagner, A. P., Stochl, J., Benton, A., Lathia, N., Howarth, E., & 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. *Lancet Public Health*, *3*(2), e72–e81. https://doi.org/10.1016/S2468-2667(17)30231-1

Gallego, J., Aguilar-Parra, J. M., Cangas, A. J., Langer, Á. I., & Mañas, I. (2015). Effect of a mindfulness program on stress, anxiety and depression in university students. *The Spanish Journal of Psychology*, *17*, Article e109. https://doi.org/10.1017/sjp.2014.102

Garland, E. L. (2013). *Mindfulness-oriented recovery enhancement for additions, stress, and pain*. NASW Press.

Garland, E. L., Manusov, E. G., Froeliger, B., Kelly, A., Williams, J. M., & Howard, M. O. (2014). Mindfulness-oriented recovery enhancement for chronic pain and prescription opioid misuse: Results from an early-stage randomized controlled trial. *Journal of Consulting and Clinical Psychology*, *82*(3), 448–459. https://doi.org/10.1037/a0035798

Garlick, H. (2017, February 3). The madness of mindfulness. *Financial Times*. https://www.ft.com/content/9b8c0c6e-e805-11e6-967b-c88452263daf

Gaylord, S. A., Palsson, O. S., Garland, E. L., Faurot, K. R., Coble, R. S., Mann, J. D., Frey, W., Leniek, K., & Whitehead, W. E. (2011). Mindfulness training reduces the severity of irritable bowel syndrome in women: Results of a randomized controlled trial. *The American Journal of Gastroenterology*, *106*(9), 1678–1688. https://doi.org/10.1038/ajg.2011.184

Gelles, D. (2012, August 24). The mind business. *Financial Times*. https://www.ft.com/content/d9cb7940-ebea-11e1-985a-00144feab49a

Gelles, D. (2015, February 27). At Aetna, a C.E.O.'s management by mantra. *The New York Times*. https://www.nytimes.com/2015/03/01/business/at-aetna-a-ceos-management-by-mantra.html

Girden, E. R. (1992). *ANOVA: Repeated measures*. Sage.

Goldin, P. R., & Gross, J. J. (2010). Effects of mindfulness-based stress reduction (MBSR) on emotion regulation in social anxiety disorder. *Emotion*, *10*(1), 83–91. https://doi.org/10.1037/a0018441

Goleman, D., & Davidson, R. J. (2017). *Altered traits: Science reveals how meditation changes your mind, brain, and body*. Avery.

Goleman, D. J., & Schwartz, G. E. (1976). Meditation as an intervention in stress reactivity. *Journal of Consulting and Clinical Psychology*, *44*(3), 456–466. https://doi.org/10.1037//0022-006x.44.3.456

Gonzalez-Garcia, M., Ferrer, M. J., Borras, X., Muñoz-Moreno, J. A., Miranda, C., Puig, J., Perez-Alvarez, N., Soler, J., Feliu-Soler, A., Clotet, B., & Fumaz, C. R. (2014). Effectiveness of mindfulness-based cognitive therapy on the quality of life, emotional status, and CD4 cell count of patients aging with HIV infection. *AIDS and Behavior*, *18*(4), 676–685. https://doi.org/10.1007/s10461-013-0612-z

Goodman, F. R., Kashdan, T. B., Mallard, T. T., & Schumann, M. (2014). A brief mindfulness and yoga intervention with an entire NCAA Division I athletic team: An initial investigation. *Psychology of Consciousness: Theory, Research, and Practice*, *1*(4), 339–356. https://doi.org/10.1037/cns0000022

Grabovac, A. D., Lau, M. A., & Willett, B. R. (2011). Mechanisms of mindfulness: A Buddhist psychological model. *Mindfulness*, *2*(3), 154–166. https://doi.org/10.1007/s12671-011-0054-5

Greeson, J. M., Juberg, M. K., Maytan, M., James, K., & Rogers, H. (2014). A randomized controlled trial of Koru: A mindfulness program for college students and other emerging adults. *Journal of American College Health*, *62*(4), 222–233. https://doi.org/10.1080/07448481.2014.887571

Grossman, P., Kappos, L., Gensicke, H., D'Souza, M., Mohr, D. C., Penner, I. K., & Steiner, C. (2010). MS quality of life, depression, and fatigue improve after mindfulness training: A randomized trial. *Neurology*, *75*(13), 1141–1149. https://doi.org/10.1212/WNL.0b013e3181f4d80d

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

Gunaratana, H. (2011). *Mindfulness in plain English* (20th anniversary ed.). Wisdom Publications.

Gunther Brown, C. (2017). Ethics, transparency, and diversity in mindfulness programs. In L. M. Monteiro, J. F. Compson, & F. Musten (Eds.), *Practitioner's guide to ethics and mindfulness-based interventions* (pp. 45–86). Springer International Publishing. https://doi.org/10.1007/978-3-319-64924-5_3

Gupta, S. K. (2011). Intention-to-treat concept: A review. *Perspectives in Clinical Research*, *2*(3), 109–112. https://doi.org/10.4103/2229-3485.83221

Hafenbrack, A. C., Kinias, Z., & Barsade, S. G. (2014). Debiasing the mind through meditation: Mindfulness and the sunk-cost bias. *Psychological Science*, *25*(2), 369–376. https://doi.org/10.1177/0956797613503853

Hanson, R., & Mendius, R. (2009). *Buddha's brain: The practical neuroscience of happiness, love & wisdom*. New Harbinger Publications, Inc.

Hedman, E., Andersson, E., Ljótsson, B., Andersson, G., Rück, C., & Lindefors, N. (2011). Cost-effectiveness of internet-based cognitive behavior therapy vs. cognitive behavioral group therapy for social anxiety disorder: Results from a randomized controlled trial. *Behaviour Research and Therapy*, *49*(11), 729–736. https://doi.org/10.1016/j.brat.2011.07.009

Heuman, L. (2014). The science delusion. *Tricycle*. https://tricycle.org/magazine/science-delusion/

Hindman, R. K., Glass, C. R., Arnkoff, D. B., & Maron, D. D. (2015). A comparison of formal and informal mindfulness programs for stress reduction in university students. *Mindfulness*, *6*(4), 873–884. https://doi.org/10.1007/s12671-014-0331-1

Ho, H.-C., Koo, M., Tsai, T.-H., & Chen, C.-Y. (2015). Effects of a mindfulness meditation course on learning and cognitive performance among university students in Taiwan. *Evidence-Based Complementary and Alternative Medicine*, *2015*, Article 254358. https://doi.org/10.1155/2015/254358

Hodgins, H. S., & Adair, K. C. (2010). Attentional processes and meditation. *Consciousness and Cognition*, *19*(4), 872–878. https://doi.org/10.1016/j.concog.2010.04.002

Hoge, E. A., Bui, E., Marques, L., Metcalf, C. A., Morris, L. K., Robinaugh, D. J., Worthington, J. J., Pollack, M. H., & Simon, N. M. (2013). Randomized controlled trial of mindfulness meditation for generalized anxiety disorder: Effects on anxiety and stress reactivity. *The Journal of Clinical Psychiatry*, *74*(8), 786–792. https://doi.org/10.4088/JCP.12m08083

Hope, R. M. (2013). *Rmisc: Ryan miscellaneous.* (Version 1.5). https://CRAN.R-project.org/package=Rmisc

Hothorn, T., Hornik, K., van de Wiel, M. A., & Zeileis, A. (2008). Implementing a Class of Permutation Tests: The coin Package. *Journal of Statistical Software*, *28*(8), 1–23. https://epub.wu.ac.at/id/eprint/4004

Howells, A., Ivtzan, I., & Eiroa-Orosa, F. J. (2016). Putting the 'app' in happiness: A randomised controlled trial of a smartphone-based mindfulness intervention to enhance wellbeing. *Journal of Happiness Studies*, *17*(1), 163–185. https://doi.org/10.1007/s10902-014-9589-1

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

Huijbers, M. J., Spinhoven, P., Spijker, J., Ruhé, H. G., van Schaik, D. J. F., van Oppen, P., Nolen, W. A., Ormel, J., Kuyken, W., van der Wilt, G. J., Blom, M. B. J., Schene, A. H., Rogier, A., Donders, T., & Speckens,

A. E. M. (2016). Discontinuation of antidepressant medication after mindfulness-based cognitive therapy for recurrent depression: Randomised controlled non-inferiority trial. *The British Journal of Psychiatry*, *208*(4), 366–373. https://doi.org/10.1192/bjp.bp.115.168971

Hülsheger, U. R., Alberts, H. J. E. M., Feinholdt, A., & Lang, J. W. B. (2013). Benefits of mindfulness at work: The role of mindfulness in emotion regulation, emotional exhaustion, and job satisfaction. *The Journal of Applied Psychology*, *98*(2), 310–325. https://doi.org/10.1037/a0031313

Hülsheger, U. R., Lang, J. W. B., Depenbrock, F., Fehrmann, C., Zijlstra, F. R. H., & Alberts, H. J. E. M. (2014). The power of presence: The role of mindfulness at work for daily levels and change trajectories of psychological detachment and sleep quality. *The Journal of Applied Psychology*, *99*(6), 1113–1128. https://doi.org/10.1037/a0037702

Jackson, D. N. (2013). *SigmaRadius 360 Degree Feedback*. Sigma Assessment Systems, Inc.

Jain, S., Shapiro, S. L., Swanick, S., Roesch, S. C., Mills, P. J., Bell, I., & Schwartz, G. E. R. (2007). A randomized controlled trial of mindfulness meditation versus relaxation training: Effects on distress, positive states of mind, rumination, and distraction. *Annals of Behavioral Medicine*, *33*(1), 11–21. https://doi.org/10.1207/s15324796abm3301_2

Jamieson, S. D., & Tuckey, M. R. (2017). Mindfulness interventions in the workplace: A critique of the current state of the literature. *Journal of*

Occupational Health Psychology, *22*(2), 180–193. https://doi.org/10.1037/ocp0000048

Jaseja, H. (2005). Meditation may predispose to epilepsy: An insight into the alteration in brain environment induced by meditation. *Medical Hypotheses*, *64*(3), 464–467. https://doi.org/10.1016/j.mehy.2004.09.012

Jensen, C. G., Vangkilde, S., Frokjaer, V., & Hasselbalch, S. G. (2012). Mindfulness training affects attention—Or is it attentional effort? *Journal of Experimental Psychology: General*, *141*(1), 106–123. https://doi.org/10.1037/a0024931

Jha, A. P., Krompinger, J., & Baime, M. J. (2007). Mindfulness training modifies subsystems of attention. *Cognitive, Affective & Behavioral Neuroscience*, *7*(2), 109–119. https://doi.org/10.3758/cabn.7.2.109

Jha, A. P., Morrison, A. B., Dainer-Best, J., Parker, S., Rostrup, N., & Stanley, E. A. (2015). Minds "at attention": Mindfulness training curbs attentional lapses in military cohorts. *PloS One*, *10*(2), Article e0116889. https://doi.org/10.1371/journal.pone.0116889

Johansson, R., & Andersson, G. (2012). Internet-based psychological treatments for depression. *Expert Review of Neurotherapeutics*, *12*(7), 861–869. https://doi.org/10.1586/ern.12.63

Joo, H. M., Lee, S. J., Chung, Y. G., & Shin, I. Y. (2010). Effects of mindfulness based stress reduction program on depression, anxiety and stress in patients with aneurysmal subarachnoid hemorrhage.

Journal of Korean Neurosurgical Society, *47*(5), 345–351. https://doi.org/10.3340/jkns.2010.47.5.345

Judd, C. M., Kenny, D. A., & McClelland, G. H. (2001). Estimating and testing mediation and moderation in within-subject designs. *Psychological Methods*, *6*(2), 115–134. https://doi.org/10.1037/1082-989x.6.2.115

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

Kabat-Zinn, J. (2005). *Wherever you go there you are: Mindfulness meditation in everyday life* (10th Anniversary ed.). Hyperion.

Kabat-Zinn, J. (2012). *Mindfulness for beginners: Reclaiming the present moment — and your life*. Sounds True, Inc.

Kabat-Zinn, J., Lipworth, L., & Burney, R. (1985). The clinical use of mindfulness meditation for the self-regulation of chronic pain. *Journal of Behavioral Medicine*, *8*(2), 163–190. https://doi.org/10.1007/bf00845519

Kabat-Zinn, J., Wheeler, E., Light, T., Skillings, A., Scharf, M. J., Cropley, T. G., Hosmer, D., & Bernhard, J. D. (1998). Influence of a mindfulness meditation-based stress reduction intervention on rates of skin clearing in patients with moderate to severe psoriasis undergoing

photo therapy (UVB) and photochemotherapy (PUVA). *Psychosomatic Medicine*, *60*(5), 625–632. https://doi.org/10.1097/00006842-199809000-00020

Kassambara, A. (2020). *rstatix: Pipe-friendly framework for basic statistical tests* (Version 0.4.0). https://CRAN.R-project.org/package=rstatix

Kearney, D. J., Simpson, T. L., Malte, C. A., Felleman, B., Martinez, M. E., & Hunt, S. C. (2016). Mindfulness-based stress reduction in addition to usual care is associated with improvements in pain, fatigue, and cognitive failures among veterans with Gulf War illness. *The American Journal of Medicine*, *129*(2), 204–214. https://doi.org/10.1016/j.amjmed.2015.09.015

Keng, S.-L., Smoski, M. J., & Robins, C. J. (2011). Effects of mindfulness on psychological health: A review of empirical studies. *Clinical Psychology Review*, *31*(6), 1041–1056. https://doi.org/10.1016/j.cpr.2011.04.006

Keye, M. D., & Pidgeon, A. M. (2013). An investigation of the relationship between resilience, mindfulness, and academic self-efficacy. *Open Journal of Social Sciences*, *1*(6), 1–4. https://doi.org/10.4236/jss.2013.16001

Kharlas, D. (2018). *The development and validation of a preliminary meditation intentions questionnaire* (Publication No. 5832) [Master's thesis, Western University]. Scholarship@Western. https://ir.lib.uwo.ca/etd/5832/

Khoury, B., Sharma, M., Rush, S. E., & Fournier, C. (2015). Mindfulness-based stress reduction for healthy individuals: A meta-analysis. *Journal of Psychosomatic Research*, *78*(6), 519–528. https://doi.org/10.1016/j.jpsychores.2015.03.009

Kiken, L. G., & Shook, N. J. (2011). Looking up: Mindfulness increases positive judgments and reduces negativity bias. *Social Psychological and Personality Science*, *2*(4), 425–431. https://doi.org/10.1177/1948550610396585

Klatt, M. D., Buckworth, J., & Malarkey, W. B. (2009). Effects of low-dose mindfulness-based stress reduction (MBSR-ld) on working adults. *Health Education & Behavior*, *36*(3), 601–614. https://doi.org/10.1177/1090198108317627

Kocalevent, R.-D., Hinz, A., & Brähler, E. (2013). Standardization of the depression screener patient health questionnaire (PHQ-9) in the general population. *General Hospital Psychiatry*, *35*(5), 551–555. https://doi.org/10.1016/j.genhosppsych.2013.04.006

Kolahkaj, B., & Zargar, F. (2015). Effect of mindfulness-based stress reduction on anxiety, depression and stress in women with multiple sclerosis. *Nursing and Midwifery Studies*, *4*(4), Article e29655. https://doi.org/10.17795/nmsjournal29655

Kornfield, J. (1977). *Living Buddhist masters*. Unity Press.

Krasner, M. S., Epstein, R. M., Beckman, H., Suchman, A. L., Chapman, B., Mooney, C. J., & Quill, T. E. (2009). Association of an educational program in mindful communication with burnout, empathy, and attitudes among primary care physicians. *The Journal of the American Medical Association*, *302*(12), 1284–1293. https://doi.org/10.1001/jama.2009.1384

Krill, P. R., Johnson, R., & Albert, L. (2016). The prevalence of substance use and other mental health concerns among American attorneys. *Journal of Addiction Medicine*, *10*(1), 46–52. https://doi.org/10.1097/ADM.0000000000000182

Krishnakumar, S., & Robinson, M. D. (2015). Maintaining an even keel: An affect-mediated model of mindfulness and hostile work behavior. *Emotion*, *15*(5), 579–589. https://doi.org/10.1037/emo0000060

Krusche, A., Jack, C. D., Blunt, C., & Hsu, A. (2020). Mindfulness-based organisational education: An evaluation of a mindfulness course delivered to employees at the Royal Orthopaedic Hospital. *Mindfulness*, *11*(2), 362–373. https://doi.org/10.1007/s12671-019-01121-x

Kuyken, W., Byford, S., Taylor, R. S., Watkins, E., Holden, E., White, K., Barrett, B., Byng, R., Evans, A., Mullan, E., & Teasdale, J. D. (2008). Mindfulness-based cognitive therapy to prevent relapse in recurrent

depression. *Journal of Consulting and Clinical Psychology*, *76*(6), 966–978. https://doi.org/10.1037/a0013786

Lakens, D. (2013). Calculating and reporting effect sizes to facilitate cumulative science: A practical primer for t-tests and ANOVAs. *Frontiers in Psychology*, *4*, Article 863. https://doi.org/10.3389/fpsyg.2013.00863

Lao, S.-A., Kissane, D., & Meadows, G. (2016). Cognitive effects of MBSR/MBCT: A systematic review of neuropsychological outcomes. *Consciousness and Cognition*, *45*, 109–123. https://doi.org/10.1016/j.concog.2016.08.017

Lau, M. A., Bishop, S. R., Segal, Z. V., Buis, T., Anderson, N. D., Carlson, L., Shapiro, S., Carmody, J., Abbey, S., & Devins, G. (2006). The Toronto Mindfulness Scale: Development and validation. *Journal of Clinical Psychology*, *62*(12), 1445–1467. https://doi.org/10.1002/jclp.20326

Lawrence, M. A. (2016). *ez: Easy analysis and visualization of factorial experiments* (Version 4.4–0). https://CRAN.R-project.org/package=ez

Lazar, S. W., Bush, G., Gollub, R. L., Fricchione, G. L., Khalsa, G., & Benson, H. (2000). Functional brain mapping of the relaxation response and meditation. *Neuroreport*, *11*(7), 1581–1585. https://doi.org/10.1097/00001756-200005150-00042

Leizerman, M., & Rinsen Weik, J. (2018). *The Zen Lawyer: Winning with Mindfulness*. Trial Guides LLC.

Lipson, S. K., Zhou, S., Wagner, B., Beck, K., & Eisenberg, D. (2016). Major differences: Variations in undergraduate and graduate student mental health and treatment utilization across academic disciplines. *Journal of College Student Psychotherapy*, *30*(1), 23–41. https://doi.org/10.1080/87568225.2016.1105657

Lomas, T., Medina, J. C., Ivtzan, I., Rupprecht, S., Hart, R., & Eiroa-Orosa, F. J. (2017). The impact of mindfulness on well-being and performance in the workplace: An inclusive systematic review of the empirical literature. *European Journal of Work and Organizational Psychology*, *26*(4), 492–513. https://doi.org/10.1080/1359432X.2017.1308924

Long, E. C., & Christian, M. S. (2015). Mindfulness buffers retaliatory responses to injustice: A regulatory approach. *The Journal of Applied Psychology*, *100*(5), 1409–1422. https://doi.org/10.1037/apl0000019

Lovibond, S. H., & Lovibond, P. F. (1995). *Manual for the depression anxiety stress scales (DASS)* (Version 2). Psychology Foundation of Australia.

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), 266–274. https://doi.org/10.1097/MLR.0b013e318160d093

Lüdecke, D. (2018). ggeffects: Tidy data frames of marginal effects from regression models. *Journal of Open Source Software*, *3*(26), Article 772. https://doi.org/10.21105/joss.00772

Lueke, A., & Gibson, B. (2014). Mindfulness meditation reduces implicit age and race bias: The role of reduced automaticity of responding. *Social Psychological and Personality Science*, *6*(3), 284–291. https://doi.org/10.1177/1948550614559651

Lustyk, M. K. B., Chawla, N., Nolan, R. S., & Marlatt, G. A. (2009). Mindfulness meditation research: Issues of participant screening, safety procedures, and researcher training. *Advances in Mind-Body Medicine*, *24*(1), 20–30. https://www.ncbi.nlm.nih.gov/pubmed/20671334

Lykins, E. L. B., & Baer, R. A. (2009). Psychological functioning in a sample of long-term practitioners of mindfulness meditation. *Journal of Cognitive Psychotherapy*, *23*(3), 226–241. https://doi.org/10.1891/0889-8391.23.3.226

Lynch, S., Gander, M.-L., Nahar, A., Kohls, N., & Walach, H. (2018). Mindfulness-based coping with university life: A randomized wait-list controlled study. *SAGE Open*, *8*(1). https://doi.org/10.1177/2158244018758379

Ma, S. H., & Teasdale, J. D. (2004). Mindfulness-based cognitive therapy for depression: Replication and exploration of differential relapse

prevention effects. *Journal of Consulting and Clinical Psychology*, *72*(1), 31–40. https://doi.org/10.1037/0022-006X.72.1.31

Mair, P., & Wilcox, R. (2020). Robust statistical methods in R using the WRS2 package. *Behavior Research Methods*, *52*(2), 464–488. https://doi.org/10.3758/s13428-019-01246-w

Mani, M., Kavanagh, D. J., Hides, L., & Stoyanov, S. R. (2015). Review and evaluation of mindfulness-based iPhone apps. *Journal of Medical Internet Research: mHealth and uHealth*, *3*(3), Article e82. https://doi.org/10.2196/mhealth.4328

Martin, N. (2018). *Lawyering from the inside out: Learning professional development through mindfulness and emotional intelligence*. Cambridge University Press.

Martin, N., & Laws, J. (2018). The lawyer in society: Popular culture images of lawyers and your self-image. In *Lawyering from the inside out: Learning professional development through mindfulness and emotional intelligence* (pp. 48–55). Cambridge University Press.

McBee, L. (2008). *Mindfulness-based elder care: A CAM model for frail elders and their caregivers*. Springer Publishing Company, LLC.

McHugh, M. L. (2013). The chi-square test of independence. *Biochemia Medica*, *23*(2), 143–149. https://doi.org/10.11613/bm.2013.018

McKeering, P., & Hwang, Y.-S. (2019). A systematic review of mindfulness-based school interventions with early adolescents. *Mindfulness*, *10*(4), 593–610. https://doi.org/10.1007/s12671-018-0998-9

Melzack, R., & Wall, P. D. (1965). Pain mechanisms: A new theory. *Science*, *150*(3699), 971–979. https://doi.org/10.1126/science.150.3699.971

Messer, D., Horan, J. J., Turner, W., & Weber, W. (2016). The effects of internet-delivered mindfulness training on stress, coping, and mindfulness in university students. *AERA Open*, *2*(1). https://doi.org/10.1177/2332858415625188

Meyer, D., Zeileis, A., & Hornick, K. (2020). *vcd: Visualizing categorical data* (Version 1.4–7). https://CRAN.R-project.org/package=vcd

Moayedi, M., & Davis, K. D. (2013). Theories of pain: From specificity to gate control. *Journal of Neurophysiology*, *109*(1), 5–12. https://doi.org/10.1152/jn.00457.2012

Modinos, G., Ormel, J., & Aleman, A. (2010). Individual differences in dispositional mindfulness and brain activity involved in reappraisal of emotion. *Social Cognitive and Affective Neuroscience*, *5*(4), 369–377. https://doi.org/10.1093/scan/nsq006

Moore, A., & Malinowski, P. (2009). Meditation, mindfulness and cognitive flexibility. *Consciousness and Cognition*, *18*(1), 176–186. https://doi.org/10.1016/j.concog.2008.12.008

Morone, N. E., Greco, C. M., Moore, C. G., Rollman, B. L., Lane, B., Morrow, L. A., Glynn, N. W., & Weiner, D. K. (2016). A mind-body program for older adults with chronic low back pain: A randomized clinical trial. *The Journal of the American Medical Association: Internal Medicine*, *176*(3), 329–337. https://doi.org/10.1001/jamainternmed.2015.8033

Morrison, A. B., Goolsarran, M., Rogers, S. L., & Jha, A. P. (2014). Taming a wandering attention: Short-form mindfulness training in student cohorts. *Frontiers in Human Neuroscience*, *7*, Article 897. https://doi.org/10.3389/fnhum.2013.00897

Morrison Wylde, C., Mahrer, N. E., Meyer, R. M. L., & Gold, J. I. (2017). Mindfulness for novice pediatric nurses: Smartphone application versus traditional intervention. *Journal of Pediatric Nursing*, *36*, 205–212. https://doi.org/10.1016/j.pedn.2017.06.008

Morse, D. R., Martin, J. S., Furst, M. L., & Dubin, L. L. (1977). A physiological and subjective evaluation of meditation, hypnosis, and relaxation. *Psychosomatic Medicine*, *39*(5), 304–324. https://doi.org/10.1097/00006842-197709000-00004

Mrazek, M. D., Smallwood, J., & Schooler, J. W. (2012). Mindfulness and mind-wandering: Finding convergence through opposing constructs. *Emotion*, *12*(3), 442–448. https://doi.org/10.1037/a0026678

Nadler, R., Carswell, J., & Minda, J. P. (2020). Online mindfulness training increases well-being, emotional intelligence, and workplace

competency ratings: A randomized waitlist-controlled trial. *Frontiers in Psychology*, *11*, Article 255. https://doi.org/10.3389/fpsyg.2020.00255

Nhat Hanh, T. (1976). *The miracle of mindfulness: A manual of meditation*. Beacon Press.

Olejnik, S., & Algina, J. (2003). Generalized eta and omega squared statistics: Measures of effect size for some common research designs. *Psychological Methods*, *8*(4), 434–447. https://doi.org/10.1037/1082-989X.8.4.434

Ong, J. C., Manber, R., Segal, Z., Xia, Y., Shapiro, S., & Wyatt, J. K. (2014). A randomized controlled trial of mindfulness meditation for chronic insomnia. *Sleep*, *37*(9), 1553–1563. https://doi.org/10.5665/sleep.4010

Oreskovich, M. R., Kaups, K. L., Balch, C. M., Hanks, J. B., Satele, D., Sloan, J., Meredith, C., Buhl, A., Dyrbye, L. N., & Shanafelt, T. D. (2012). Prevalence of alcohol use disorders among American surgeons. *Archives of Surgery*, *147*(2), 168–174. https://doi.org/10.1001/archsurg.2011.1481

Organ, J. M., Jaffe, D. B., & Bender, K. M. (2016). Suffering in silence: The survey of law student well-being and the reluctance of law students to seek help for substance use and mental health concerns. *Journal of Legal Education*, *66*(1), 116–156. https://www.jstor.org/stable/26402424

Ostafin, B. D., & Kassman, K. T. (2012). Stepping out of history: Mindfulness improves insight problem solving. *Consciousness and Cognition*, *21*(2), 1031–1036. https://doi.org/10.1016/j.concog.2012.02.014

Palmer, A., & Rodger, S. (2009). Mindfulness, stress, and coping among university students. *Canadian Journal of Counselling and Psychotherapy*, *43*(3), 198–212. https://cjc-rcc.ucalgary.ca/article/view/59019

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

Plaza, I., Demarzo, M. M. P., Herrera-Mercadal, P., & García-Campayo, J. (2013). Mindfulness-based mobile applications: Literature review and analysis of current features. *Journal of Medical Internet Research: mHealth and uHealth*, *1*(2), Article e24. https://doi.org/10.2196/mhealth.2733

Polusny, M. A., Erbes, C. R., Thuras, P., Moran, A., Lamberty, G. J., Collins, R. C., Rodman, J. L., & Lim, K. O. (2015). Mindfulness-based stress reduction for posttraumatic stress disorder among veterans: A randomized clinical trial. *The Journal of the American Medical Association*, *314*(5), 456–465. https://doi.org/10.1001/jama.2015.8361

Psychology Foundation of Australia. (2018, July 26). *Overview of the DASS and its uses*. DASS. http://www2.psy.unsw.edu.au/dass//over.htm

Purser, R. E. (2015). Clearing the muddled path of traditional and contemporary mindfulness: A response to Monteiro, Musten, and Compson. *Mindfulness*, *6*(1), 23–45. https://doi.org/10.1007/s12671-014-0373-4

Purser, R. E., & Milillo, J. (2015). Mindfulness revisited: A Buddhist-based conceptualization. *Journal of Management Inquiry*, *24*(1), 3–24. https://doi.org/10.1177/1056492614532315

Purser, R., & Loy, D. (2013, July 1). Beyond mcmindfulness. *HuffPost*. https://www.huffpost.com/entry/beyond-mcmindfulness_b_3519289

Qualtrics. (2005). *Qualtrics* (Version 2016-2019). https://www.qualtrics.com

Querstret, D., Cropley, M., & Fife-Schaw, C. (2018). The effects of an online mindfulness intervention on perceived stress, depression and anxiety in a non-clinical sample: A randomised waitlist control trial. *Mindfulness*, *9*(6), 1825–1836. https://doi.org/10.1007/s12671-018-0925-0

R Core Team. (2020). *R: A language and environment for statistical computing* (Version 3.6.3). https://www.R-project.org/

Ramler, T. R., Tennison, L. R., Lynch, J., & Murphy, P. (2016). Mindfulness and the college transition: The efficacy of an adapted mindfulness-based stress reduction intervention in fostering adjustment among

first-year students. *Mindfulness*, *7*(1), 179–188. https://doi.org/10.1007/s12671-015-0398-3

Ramli, H., Hamizah, N., Alavi, M., Mehrinezhad, S. A., & Ahmadi, A. (2018). Academic stress and self-regulation among university students in Malaysia: Mediator role of mindfulness. *Behavioral Sciences*, *8*(1), Article 12. https://doi.org/10.3390/bs8010012

Ranganathan, P., Pramesh, C. S., & Aggarwal, R. (2016). Common pitfalls in statistical analysis: Intention-to-treat versus per-protocol analysis. *Perspectives in Clinical Research*, *7*(3), 144–146. https://doi.org/10.4103/2229-3485.184823

Reb, J., Narayanan, J., & Chaturvedi, S. (2014). Leading mindfully: Two studies on the influence of supervisor trait mindfulness on employee well-being and performance. *Mindfulness*, *5*(1), 36–45. https://doi.org/10.1007/s12671-012-0144-z

Revelle, W. (2019). *psych: Procedures for personality and psychological research* (Version 1.9.12). https://CRAN.R-project.org/package=psych

Riskin, L. L. (2002). The contemplative lawyer: On the potential contributions of mindfulness meditation to law students, lawyers, and their clients. *Harvard Negotiation Law Review*, *7*, 1–66. http://mindfullawyerconference.org/pdf/art-10Harvard-Riskin.pdf

Robertson, I. H., Manly, T., Andrade, J., Baddeley, B. T., & Yiend, J. (1997). "Oops!": Performance correlates of everyday attentional failures in

traumatic brain injured and normal subjects. *Neuropsychologia*, *35*(6), 747–758. https://doi.org/10.1016/S0028-3932(97)00015-8

Roche, M., Haar, J. M., & Luthans, F. (2014). The role of mindfulness and psychological capital on the well-being of leaders. *Journal of Occupational Health Psychology*, *19*(4), 476–489. https://doi.org/10.1037/a0037183

Roeser, R. W., Schonert-Reichl, K. A., Jha, A., Cullen, M., Wallace, L., Wilensky, R., Oberle, E., Thomson, K., Taylor, C., & Harrison, J. (2013). Mindfulness training and reductions in teacher stress and burnout: Results from two randomized, waitlist-control field trials. *Journal of Educational Psychology*, *105*(3), 787–804. https://doi.org/10.1037/a0032093

Rosenkranz, M. A., Davidson, R. J., Maccoon, D. G., Sheridan, J. F., Kalin, N. H., & Lutz, A. (2013). A comparison of mindfulness-based stress reduction and an active control in modulation of neurogenic inflammation. *Brain, Behavior, and Immunity*, *27*(1), 174–184. https://doi.org/10.1016/j.bbi.2012.10.013

Schlemper, M. B. (2011). Challenges and coping in graduate school. *The Geographical Bulletin*, *52*(2), 67–72. http://gammathetaupsilon.org/the-geographical-bulletin/2010s/volume52-2/article2.pdf

Schramm-Possinger, M. E., & Powers, D. E. (2015). *The first year of graduate study: Documenting challenges and informing ways to reduce attrition*.

Educational Testing Service. https://www.ets.org/Media/Research/pdf/RM-15-02.pdf

Scott, C. (2018). Mindfulness in law: A path to well-being and balance for lawyers and law students. *Arizona Law Review*, *60*(3), 635–674. https://heinonline.org/HOL/P?h=hein.journals/arz60&i=657

Search Inside Yourself Leadership Institute. (n.d.). *Our clients*. Retrieved February 8, 2020, from https://siyli.org/clients

Segal, Z. V., Bieling, P., Young, T., MacQueen, G., Cooke, R., Martin, L., Bloch, R., & Levitan, R. D. (2010). Antidepressant monotherapy vs sequential pharmacotherapy and mindfulness-based cognitive therapy, or placebo, for relapse prophylaxis in recurrent depression. *Archives of General Psychiatry*, *67*(12), 1256–1264. https://doi.org/10.1001/archgenpsychiatry.2010.168

Segal, Z. V., Williams, J. M. G., & Teasdale, J. D. (2002). *Mindfulness-based cognitive therapy for depression: A new approach to preventing relapse*. Guilford Press.

SeyedAlinaghi, S., Jam, S., Foroughi, M., Imani, A., Mohraz, M., Djavid, G. E., & Black, D. S. (2012). RCT of mindfulness-based stress reduction delivered to HIV+ patients in Iran: Effects on CD4+ T lymphocyte count and medical and psychological symptoms. *Psychosomatic Medicine*, *74*(6), 620–627. https://doi.org/10.1097/PSY.0b013e31825abfaa

Shapiro, S. L., Astin, J. A., Bishop, S. R., & Cordova, M. (2005). Mindfulness-based stress reduction for health care professionals: Results from a randomized trial. *International Journal of Stress Management*, *12*(2), 164 –176. https://doi.org/10.1037/1072-5245.12.2.164

Shapiro, S. L., Brown, K. W., & Biegel, G. M. (2007). Teaching self-care to caregivers: Effects of mindfulness-based stress reduction on the mental health of therapists in training. *Training and Education in Professional Psychology*, *1*(2), 105–115. https://doi.org/10.1037/1931-3918.1.2.105

Shapiro, S. L., Brown, K. W., Thoresen, C., & Plante, T. G. (2011). The moderation of mindfulness-based stress reduction effects by trait mindfulness: Results from a randomized controlled trial. *Journal of Clinical Psychology*, *67*(3), 267–277. https://doi.org/10.1002/jclp.20761

Shapiro, S. L., Carlson, L. E., Astin, J. A., & Freedman, B. (2006). Mechanisms of mindfulness. *Journal of Clinical Psychology*, *62*(3), 373–386. https://doi.org/10.1002/jclp.20237

Shapiro, S. L., Schwartz, G. E., & Bonner, G. (1998). Effects of mindfulness-based stress reduction on medical and premedical students. *Journal of Behavioral Medicine*, *21*(6), 581–599. https://doi.org/10.1023/a:1018700829825

Sharma, M., & Rush, S. E. (2014). Mindfulness-based stress reduction as a stress management intervention for healthy individuals: A systematic

review. *Journal of Evidence-Based Complementary & Alternative Medicine*, *19*(4), 271–286. https://doi.org/10.1177/2156587214543143

Sheldon, K. M., & Krieger, L. S. (2004). Does legal education have undermining effects on law students? Evaluating changes in motivation, values, and well-being. *Behavioral Sciences & the Law*, *22*(2), 261–286. https://doi.org/10.1002/bsl.582

Sheldon, K. M., & Krieger, L. S. (2007). Understanding the negative effects of legal education on law students: A longitudinal test of self-determination theory. *Personality & Social Psychology Bulletin*, *33*(6), 883–897. https://doi.org/10.1177/0146167207301014

Shore, R., Strauss, C., Cavanagh, K., Hayward, M., & Ellett, L. (2018). A randomised controlled trial of a brief online mindfulness-based intervention on paranoia in a non-clinical sample. *Mindfulness*, *9*(1), 294–302. https://doi.org/10.1007/s12671-017-0774-2

Sinclair, S. J., Siefert, C. J., Slavin-Mulford, J. M., Stein, M. B., Renna, M., & Blais, M. A. (2011). Psychometric evaluation and normative data for the Depression, Anxiety, and Stress Scales-21 (DASS-21) in a nonclinical sample of US adults. *Evaluation & the Health Professions*, *35*(3), 259–279. https://doi.org/10.1177/0163278711424282

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

Singh, N. N., Singh, S. D., Sabaawi, M., Myers, R. E., & Wahler, R. G. (2006). Enhancing treatment team process through mindfulness-based mentoring in an inpatient psychiatric hospital. *Behavior Modification*, *30*(4), 423–441. https://doi.org/10.1177/0145445504272971

Sizoo, B. B., & Kuiper, E. (2017). Cognitive behavioural therapy and mindfulness based stress reduction may be equally effective in reducing anxiety and depression in adults with autism spectrum disorders. *Research in Developmental Disabilities*, *64*, 47–55. https://doi.org/10.1016/j.ridd.2017.03.004

Slonim, J., Kienhuis, M., Di Benedetto, M., & Reece, J. (2015). The relationships among self-care, dispositional mindfulness, and psychological distress in medical students. *Medical Education Online*, *20*(1), Article 27924. https://doi.org/10.3402/meo.v20.27924

Slutsky, J., Chin, B., Raye, J., & Creswell, J. D. (2019). Mindfulness training improves employee well-being: A randomized controlled trial. *Journal of Occupational Health Psychology*, *24*(1), 139–149. https://doi.org/10.1037/ocp0000132

Smith, B. W., Dalen, J., Wiggins, K., Tooley, E., Christopher, P., & Bernard, J. (2008). The Brief Resilience Scale: Assessing the ability to bounce back. *International Journal of Behavioral Medicine*, *15*(3), 194–200. https://doi.org/10.1080/10705500802222972

Snelling, J. (1987). *The Buddhist handbook: A complete guide to Buddhist teaching and practice*. Century Hutchinson Ltd.

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

Speca, M., Carlson, L. E., Goodey, E., & Angen, M. (2000). A randomized, wait-list controlled clinical trial: The effect of a mindfulness meditation-based stress reduction program on mood and symptoms of stress in cancer outpatients. *Psychosomatic Medicine*, *62*(5), 613–622. https://doi.org/10.1097/00006842-200009000-00004

Spijkerman, M. P. J., Pots, W. T. M., & Bohlmeijer, E. T. (2016). Effectiveness of online mindfulness-based interventions in improving mental health: A review and meta-analysis of randomised controlled trials. *Clinical Psychology Review*, *45*, 102–114. https://doi.org/10.1016/j.cpr.2016.03.009

Stanley, E. A., Schaldach, J. M., Kiyonaga, A., & Jha, A. P. (2011). Mindfulness-based mind fitness training: A case study of a high-stress predeployment military cohort. *Cognitive and Behavioral Practice*, *18*(4), 566–576. https://doi.org/10.1016/j.cbpra.2010.08.002

Tanay, G., & Bernstein, A. (2013). State Mindfulness Scale (SMS): Development and initial validation. *Psychological Assessment*, *25*(4), 1286–1299. https://doi.org/10.1037/a0034044

Tang, Y.-Y., Ma, Y., Wang, J., Fan, Y., Feng, S., Lu, Q., Yu, Q., Sui, D., Rothbart, M. K., Fan, M., & Posner, M. I. (2007). Short-term meditation training improves attention and self-regulation. *Proceedings of the National Academy of Sciences of the United States of America*, *104*(43), 17152–17156. https://doi.org/10.1073/pnas.0707678104

Taren, A. A., Creswell, J. D., & Gianaros, P. J. (2013). Dispositional mindfulness co-varies with smaller amygdala and caudate volumes in community adults. *PloS One*, *8*(5), Article e64574. https://doi.org/10.1371/journal.pone.0064574

Taren, A. A., Gianaros, P. J., Greco, C. M., Lindsay, E. K., Fairgrieve, A., Brown, K. W., Rosen, R. K., Ferris, J. L., Julson, E., Marsland, A. L., Bursley, J. K., Ramsburg, J., & Creswell, J. D. (2015). Mindfulness meditation training alters stress-related amygdala resting state functional connectivity: A randomized controlled trial. *Social Cognitive and Affective Neuroscience*, *10*(12), 1758–1768. https://doi.org/10.1093/scan/nsv066

Teasdale, J. D., Moore, R. G., Hayhurst, H., Pope, M., Williams, S., & Segal, Z. V. (2002). Metacognitive awareness and prevention of relapse in

depression: Empirical evidence. *Journal of Consulting and Clinical Psychology*, *70*(2), 275–287. https://doi.org/10.1037//0022-006x.70.2.275

Teasdale, J. D., Segal, Z. V., Williams, J. M., Ridgeway, V. A., Soulsby, J. M., & Lau, M. A. (2000). Prevention of relapse/recurrence in major depression by mindfulness-based cognitive therapy. *Journal of Consulting and Clinical Psychology*, *68*(4), 615–623. https://doi.org/10.1037//0022-006x.68.4.615

Tett, R. P., Wang, A., & Fox, K. E. (2006). *Multidimensional emotional intelligence assessment: Technical manual*. Sigma Assessment Systems Inc.

The Graduate Assembly. (2014). *Graduate student happiness & well-being report*. http://ga.berkeley.edu/wp-content/uploads/2015/04/wellbeingreport_2014.pdf

The National Task Force on Lawyer Well-Being. (2017). *The path to lawyer well-being: Practical recommendations for positive change*. https://www.americanbar.org/content/dam/aba/images/abanews/ThePathToLawyerWellBeingReportRevFINAL.pdf

The proceedings of the mindful lawyer conference. (2010). Retrieved June 6, 2019, from http://www.mindfullawyerconference.org/

Tomczak, M., & Tomczak, E. (2014). The need to report effect size estimates revisited. An overview of some recommended measures of effect size.

Trends in Sport Sciences, *1*(21), 19–25. http://www.tss.awf.poznan.pl/files/3_Trends_Vol21_2014__no1_20.pdf

Valentine, E. R., & Sweet, P. L. G. (1999). Meditation and attention: A comparison of the effects of concentrative and mindfulness meditation on sustained attention. *Mental Health, Religion & Culture*, *2*(1), 59–70. https://doi.org/10.1080/13674679908406332

Van Breukelen, G. J. P. (2006). ANCOVA versus change from baseline: More power in randomized studies, more bias in nonrandomized studies [corrected]. *Journal of Clinical Epidemiology*, *59*(9), 920–925. https://doi.org/10.1016/j.jclinepi.2006.02.007

van den Hurk, P. A. M., Giommi, F., Gielen, S. C., Speckens, A. E. M., & Barendregt, H. P. (2010). Greater efficiency in attentional processing related to mindfulness meditation. *Quarterly Journal of Experimental Psychology*, *63*(6), 1168–1180. https://doi.org/10.1080/17470210903249365

van Leeuwen, S., Müller, N. G., & Melloni, L. (2009). Age effects on attentional blink performance in meditation. *Consciousness and Cognition*, *18*(3), 593–599. https://doi.org/10.1016/j.concog.2009.05.001

Wahbeh, H., Svalina, M. N., & Oken, B. S. (2014). Group, one-on-one, or internet? Preferences for mindfulness meditation delivery format and their predictors. *Open Medicine Journal*, *1*, 66–74. https://doi.org/10.2174/1874220301401010066

Walach, H., Buchheld, N., Buttenmüller, V., Kleinknecht, N., & Schmidt, S. (2006). Measuring mindfulness—the Freiburg Mindfulness Inventory (FMI). *Personality and Individual Differences*, *40*(8), 1543–1555. https://doi.org/10.1016/j.paid.2005.11.025

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology*, *54*(6), 1063–1070. https://doi.org/10.1037//0022-3514.54.6.1063

Wickham, H., Averick, M., Bryan, J., Chang, W., McGowan, L., François, R., Grolemund, G., Hayes, A., Henry, L., Hester, J., Kuhn, M., Lin Pederson, T., Miller, E., Milton Bache, S., Müller, K., Ooms, J., Robinson, D., Seidel, D. P., Spinu, V., … Yutani, H. (2019). Welcome to the Tidyverse. *Journal of Open Source Software*, *4*(43), Article 1686. https://doi.org/10.21105/joss.01686

Wilcox, R. R., & Tian, T. S. (2011). Measuring effect size: A robust heteroscedastic approach for two or more groups. *Journal of Applied Statistics*, *38*(7), 1359–1368. https://doi.org/10.1080/02664763.2010.498507

Williams, K. (2020, January 31). *Mobile users spent $195 million in meditation apps last year, up 52% over 2018*. Sensor Tower Blog. https://sensortower.com/blog/meditation-apps-2019-revenue-downloads

Wilson, B. M., Mickes, L., Stolarz-Fantino, S., Evrard, M., & Fantino, E. (2015). Increased false-memory susceptibility after mindfulness meditation. *Psychological Science*, *26*(10), 1567–1573. https://doi.org/10.1177/0956797615593705

Wilson, J. (2014). *Mindful America: The mutual transformation of Buddhist meditation and American culture*. Oxford University Press.

Wolever, R. Q., Bobinet, K. J., McCabe, K., Mackenzie, E. R., Fekete, E., Kusnick, C. A., & Baime, M. (2012). Effective and viable mind-body stress reduction in the workplace: A randomized controlled trial. *Journal of Occupational Health Psychology*, *17*(2), 246–258. https://doi.org/10.1037/a0027278

Young, A. F., Powers, J. R., & Bell, S. L. (2006). Attrition in longitudinal studies: Who do you lose? *Australian and New Zealand Journal of Public Health*, *30*(4), 353–361. https://doi.org/10.1111/j.1467-842x.2006.tb00849.x

Zeidan, F., Johnson, S. K., Diamond, B. J., David, Z., & Goolkasian, P. (2010). Mindfulness meditation improves cognition: Evidence of brief mental training. *Consciousness and Cognition*, *19*(2), 597–605. https://doi.org/10.1016/j.concog.2010.03.014

Zenner, C., Herrnleben-Kurz, S., & Walach, H. (2014). Mindfulness-based interventions in schools—a systematic review and meta-analysis.

Frontiers in Psychology, *5*, Article 603. https://doi.org/10.3389/fpsyg.2014.00603

Zhang, J., Ding, W., Li, Y., & Wu, C. (2013). Task complexity matters: The influence of trait mindfulness on task and safety performance of nuclear power plant operators. *Personality and Individual Differences*, *55*(4), 433–439. https://doi.org/10.1016/j.paid.2013.04.004

Zhang, J., & Wu, C. (2014). The influence of dispositional mindfulness on safety behaviors: A dual process perspective. *Accident Analysis and Prevention*, *70*, 24–32. https://doi.org/10.1016/j.aap.2014.03.006

Zimmaro, L. A., Salmon, P., Naidu, H., Rowe, J., Phillips, K., Rebholz, W. N., Giese-Davis, J., Cash, E., Dreeben, S. J., Bayley-Veloso, R., Jablonski, M. E., Hicks, A., Siwik, C., & Sephton, S. E. (2016). Association of dispositional mindfulness with stress, cortisol, and well-being among university undergraduate students. *Mindfulness*, *7*(4), 874–885. https://doi.org/10.1007/s12671-016-0526-8

Appendices

Appendix A. List of R packages used.

For calculating standard descriptive statistics —Rmisc (version 1.5; Hope, 2013).

For assessing scale consistencies (i.e., reliabilities) — psych (version 1.9.12; Revelle, 2019).

For performing chi-square tests — vcd (version 1.4–7; Meyer et al., 2020).

For performing Wilcox-Mann-Whitney and Wilcoxon signed-rank tests — coin (version 1.3–1; Hothorn et al., 2008).

For performing Levene's tests and ANCOVAs and for calculating Cohen's *d*, Wilcox-Mann-Whitney, and Wilcoxon signed-rank effect sizes — rstatix (version 0.4.0; Kassambara, 2020).

For calculating adjusted means — ggeffects (version 0.14.3; Lüdecke, 2018).

For performing Yuen's *t*-tests and for calculating explanatory power effect sizes — WRS2 (version 1.0–0; Mair & Wilcox, 2020).

For performing mixed ANOVAs — ez (version 4.4–0; Lawrence, 2016).

For creating and formatting data plots — extrafont (version 0.17; Chang, 2014), gridExtra (version 2.3; Auguie, 2017), and tidyverse (version 1.3.0; Wickham et al., 2019).

Split-violin plots were created using code derived by DeBruine (2018).

Appendix B. The Mindful Lawyer (Chapter 2): Demographic survey.

Gender

Male

Female

Age _____

Highest level of education obtained*

Less than high school

High school/GED

Some college

2-year college diploma

3-4-year university degree

Master's degree

Doctoral degree

Professional degree

How long (in years) have you been employed in your current position? _____

How many hours do you work per week (on average)? _____

Are you in a formal leadership position?

Yes

No

If yes, how many people directly report to you? _____

Indicate your job title†

Equity Shareholder

Non-Equity Shareholder

Of Counsel/Counsel

Associate

Other

Indicate your functional area*

Partner

Attorney (not partner level)

Other

Indicate the size of your home office‡

Fewer than 10

10-20

More than 20

Indicate the size of your firm or company*

Am Law 200 or similar

Small Firm

Boutique Firm

Solo Practitioner

In-House Counsel

Other

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*This question was only included in Study 1.

†In Study 1, this item was presented as an open-ended question (i.e., without a list of potential response options).

‡This question was only included in Study 2.

Appendix C. The Mindful Lawyer (Chapter 2) and the Mindful Grad Student (Chapter 3): Prior experience questions.

Do you have any prior meditative or contemplative practice experience?*

Yes

No *(0 years of practice)*†

If yes, how long have you practiced?‡

1 - 3 months *(.1$\overline{6}$ years of practice)*

3 - 6 months *(.375 years of practice)*

6 - 12 months *(.75 years of practice)*

1 - 3 years *(2 years of practice)*

3+ years (please indicate number of years) _____ *(x years of practice)*

If you practice currently, how often do you practice?

1 - 2 times per day

1 - 2 times per week

3 or more times per week

A few times a month

Other (please indicate how often) _____

Do you use any of the following apps or technologies to assist with your meditation (check all that apply)?

Insight Timer

Headspace

Muse

Buddhify

Calm

Mindfulness App

Other _____

Do you practice yoga regularly (e.g., one or more times weekly)?‡

Yes

No

If yes, how long have you practiced?‡

1 - 3 months

3 - 6 months

6 - 12 months

1 - 3 years

3+ years (please indicate number of years) _____

If you practice currently, how often do you practice?§

1 - 2 times per day

1 - 2 times per week

3 or more times per week

A few times a month

Other (please indicate how often) _____

Do you practice tai chi or any other mind-body practice (e.g., Qigong, Aikido, etc.)?

Yes

No

If yes, how long have you practiced?‡

1 - 3 months

3 - 6 months

6 - 12 months

1 - 3 years

3+ years (please indicate number of years) _____

If you practice currently, how often do you practice?[§]

1 - 2 times per day

1 - 2 times per week

3 or more times per week

A few times a month

Other (please indicate how often) _____

---

[*]In the Mindful Grad Student study, follow-up items regarding length and frequency of practice and the use of apps or technologies were only displayed if participants responded "yes" to initial questions asking if they did or did not practice a particular activity.

[†]Italicized text specifies how responses were coded for the purpose of calculating average length of previous meditation experience. This text was not displayed to participants during the survey.

[‡]The wording of this question was slightly altered in the Mindful Grad Student study.

[§]This question was not presented in the Mindful Lawyer Study 1.

Appendix D. The Mindful Lawyer (Chapter 2): The Job Effectiveness Questionnaire.

The JEQ was designed specifically for use in the studies presented in Chapter 2. This measure was adapted from the SigmaRadius 360 Degree Feedback system — a commercial job performance measure (Jackson, 2013) — as a way to assess one's perceived ability to effectively demonstrate various job-related competencies. Participants were presented with 27 job-related skills (e.g., "Decisiveness. The ability to make clear-cut and timely decisions with the appropriate amount of information.") and were asked to rate the level of effectiveness with which they performed each skill on a scale of 1 (*low*) to 7 (*high*). If a particular behaviour was not observed, participants could indicate as much by selecting "not observed" as their response. Scores were calculated by removing any items for which the participant responded "not observed" and taking an average of the ratings across all remaining items. Scores can range from 1 – 7, with high scores indicating a high degree of workplace competency. The JEQ displayed adequate levels of internal consistency across all time points in both studies (i.e., $\alpha \geq .70$; see Table D.1).

Study 1

Time 1 and 2 Comparisons

mITT analyses ($n = 45$; see Figure D.1) revealed a significant T1 ($M = 5.12$, $SD = .76$) to T2 ($M = 5.42$, $SD = .79$) increase in scores on the JEQ; $z = -3.47$, $p < .001$, $r = .52$. Results from PP analyses ($n = 44$) were found to be comparable to the results from mITT analyses.

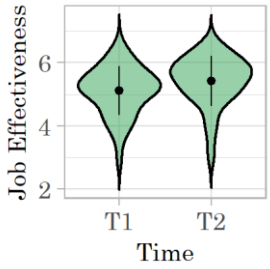
Moderation of Change Over Time

mITT analyses revealed that neither length of previous meditation experience nor amount of program participation were significant moderators

Table D.1. The Mindful Lawyer — Modified Intention-to-Treat Analyses: Internal consistency (α) of the Job Effectiveness Questionnaire.

Condition	Time 1	Time 2	Time 3	Overall
Study 1				
	.91	.94	N/A	.93
Study 2 — Comparisons Across All Three Time Points				
Control	.92	.96	.97	.95
Experimental	.75	.89	.94	.89
Conditions Combined	.89	.95	.96	.94
Study 2 — Time 2 Comparisons				
Control	.90	.95		.91
Experimental	.89	.93	N/A	.93
Conditions Combined	.89	.95		.93
Study 2 — Time 2 and 3 Comparisons				
Control	N/A	.96	.97	.97

Figure D.1. The Mindful Lawyer Study 1 — Modified Intention-to-Treat Time 1 and 2 Comparisons: Distributions of scores on the Job Effectiveness Questionnaire**.**



Note. Scores are depicted at Time 1 (T1) and Time 2 (T2). Dots and whiskers represent means and standard deviations, respectively.

of T1 to T2 change in scores on the JEQ; R^2 = .01, F(1, 43) = .65, p = .42, B = -.01 and R^2 = .04, F(1, 43) = 1.86, p = .18, B = .002, respectively. Both regressions remained non-significant following the removal of outlier responses; previous experience, R^2 = .003, F(1, 37) = .12, p = .73, B = -.04 and program participation, R^2 = .06, F(1, 41) = 2.71, p = .11, B = .004. Results from PP analyses were found to be comparable to the results from mITT analyses.

Study 2

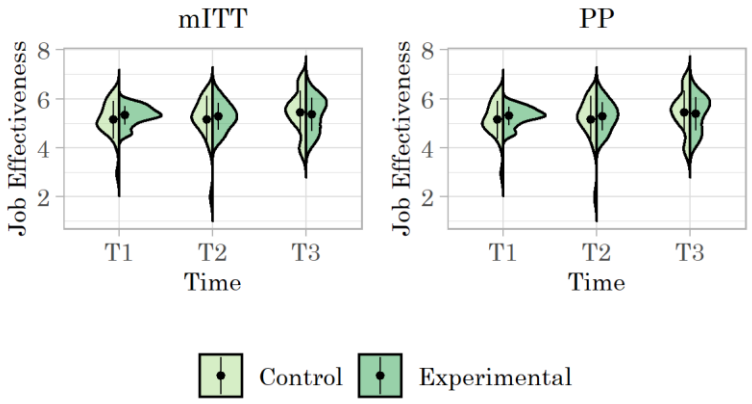
Comparisons Across All Three Time Points (see Appendix H)

In mITT analyses (n = 37; see Figure D.2), none of the effects in the 2 x 3 mixed ANOVA were found to be statistically significant; interaction, F(2, 70) = 1.38, p = .26, η^2_G = .007; main effect of condition, F(1, 35) = .13, p = .72, η^2_G = .003; and main effect of time; F(2, 70) = 2.89, p = .06, η^2_G = .01. In PP analyses (n = 36, also depicted in Figure D.2), neither the interaction nor the main effect of condition was found to be statistically significant; F(2, 68) = 1.00, p = .37, η^2_G = .01 and F(1, 34) = .12, p = .73, η^2_G = .003, respectively. The main effect of time, however, was significant, though post-hocs revealed no differences between T1 (M = 5.21, SD = .62), T2 (M = 5.21, SD = .81), or T3 (M = 5.42, SD = .78); overall, F(2, 68) = 3.48, p = .04, η^2_G = .02; T1 vs. T2, p_{adj} = .99; both T1 vs. T3 and T2 vs. T3, p_{adj} = .11.

Time 2 Comparisons

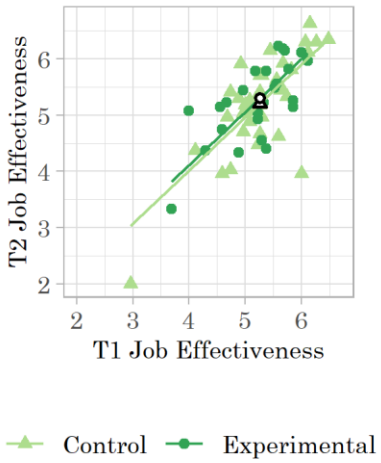
mITT analyses (n = 64; see Figure D.3) revealed that, after adjusting for differences in T1 scores (M_G = 5.26), no T2 differences on the JEQ were observed between conditions (experimental, M_{adj} = 5.30, SE = .11; control, M_{adj} = 5.21, SE = .09); F(1, 61) = .46, p = .50, η^2_G = .01. Results from PP

Figure D.2. The Mindful Lawyer Study 2 — Modified Intention-to-Treat (mITT) and Per-Protocol (PP) Comparisons Across All Three Time Points: Distributions of scores on the Job Effectiveness Questionnaire.



Note. Scores are depicted at Time 1 (T1), Time 2 (T2), and Time 3 (T3) for both the control (light green/grey) and experimental (dark green/grey) conditions. Dots and whiskers represent means and standard deviations, respectively.

Figure D.3. The Mindful Lawyer Study 2 — Modified Intention-to-Treat Time 2 Comparisons: Visual depiction of the analysis of covariance test performed on the Job Effectiveness Questionnaire.



Note. Plots depict Time 2 (T2) scores as a function of both Time 1 (T1) scores and condition (control = light green/grey triangles; experimental = dark green/grey circles). Regression lines illustrate the models used to test for condition-specific differences in T2 scores on the Job Effectiveness Questionnaire. Open triangles and circles represent adjusted means for the control and experimental conditions, respectively.

analyses (n = 63) were found to be comparable to the results from mITT analyses.

Time 2 and 3 Comparisons

mITT analyses (n = 20; see Figure D.4) revealed a significant T2 (M = 5.17, SD = .97) to T3 (M = 5.47, SD = .86) increase in control scores on the JEQ; z = -2.39, p = .01, r = -.53. Results from PP analyses were identical to the results from mITT analyses.

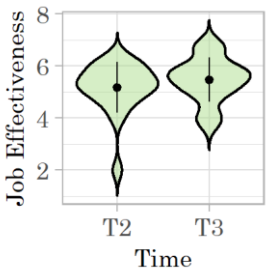
Moderation of Change Over Time

mITT analyses revealed that neither length of previous meditation experience nor amount of program participation were significant moderators of T1 to T2 change in scores on the JEQ; R^2 < .001, F(1, 41) < .001, p = .98, B < .001 and R^2 = .03, F(1, 43) = 1.33, p = .25, B = .003, respectively. Following the removal of outliers, intervention participation was found to be a significant moderator, such that more time spent meditating was found to be associated with more positive change (i.e., greater increases) on the JEQ (see Figure D.5); R^2 = .10, F(1, 41) = 4.76, p = .03, B = .01. The relationship between meditation experience and JEQ change, however, was unaffected by the removal of outlier responses; R^2 = .05, F(1, 32) = 1.67, p = .21, B = 1.57. PP analyses were identical to mITT analyses.

Supplementary Analyses (see Appendix I)

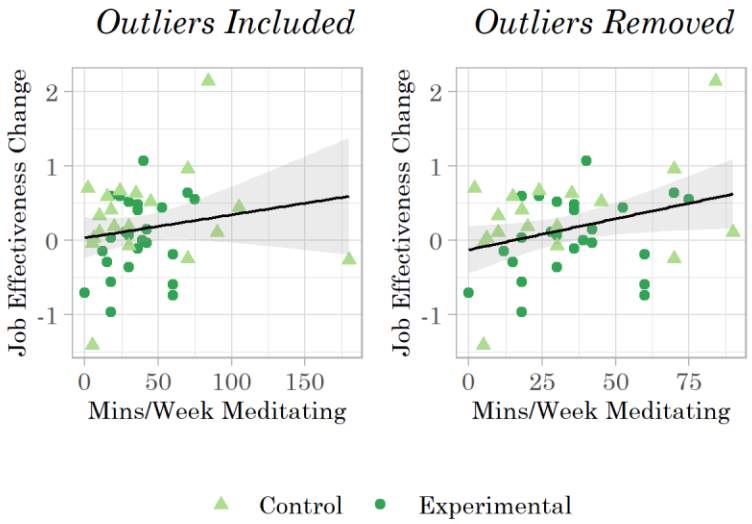
Pre-intervention scores on the JEQ did not differ between conditions in the mITT analyses (see Figure D.6); z = .17, p = .87, r = .03. Results from PP analyses were comparable to mITT analyses. Moderation analyses further revealed that pre-intervention levels of awareness did not significantly moderate the JEQ change observed in mITT analyses before or after outlier

Figure D.4. The Mindful Lawyer Study 2 — Modified Intention-to-Treat Time 2 and 3 Comparisons: Distributions of control participant scores on the Job Effectiveness Questionnaire.



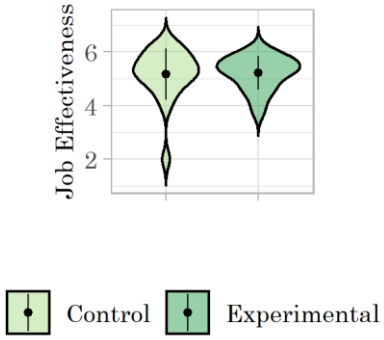
Note. Scores are depicted at Time 2 (T2) and Time 3 (T3). Dots and whiskers represent means and standard deviations, respectively

Figure D.5. The Mindful Lawyer Study 2 — Modified Intention-to-Treat Moderations: Changes in perceived job effectiveness as a function of time spent meditating during the intervention.



Note. Figures depict the moderating relationship between minutes per week spent meditating and changes in scores on the Job Effectiveness Questionnaire both before (left) and after (right) outlier removal. For participants in the control condition (light green/grey triangles), change was calculated as Time 3 – Time 2. For participants in the experimental condition (dark green/grey circles), change was calculated as Time 2 – Time 1. The shaded area represents a 95% confidence region.

Figure D.6. The Mindful Lawyer Study 2 — Modified Intention-to-Treat Supplementary Analyses: Distributions of pre-intervention scores on the Job Effectiveness Questionnaire.



Note. For participants in the control condition (light green/grey), pre-intervention refers to Time 2. For participants in the experimental condition (dark green/grey), pre-intervention refers to Time 1. Dots and whiskers represent means and standard deviations, respectively.

removal; $R^2 < .001$, $F(1, 43) = .02$, $p = .88$, $B = .003$ and $R^2 = .002$, $F(1, 41) = .08$, $p = .78$, $B = -.01$, respectively. Similarly, length of time spent working in one's current position was not a significant moderator of the JEQ change observed in PP analyses; $R^2 = .01$, $F(1, 40) = .23$, $p = .64$, $B = .005$.

Appendix E. The Mindful Lawyer (Chapter 2) and the Mindful Grad Student (Chapter 3): Program participation questions.

The Mindful Lawyer Study 1

On average, how many days did you meditate each week during the 8-week program?

2 or more times each DAY *(14 meditations/week)**

1 time each DAY *(7 meditations/week)*

3 - 5 times each WEEK (*4 meditations/week*)

1 - 2 times each WEEK *(1.5 meditations/week)*

Less than once a WEEK *(.5 meditations/week)*

Never *(0 meditations/week)*

On average, how many minutes did you meditate each time you practiced?

Less than a minute *(.5 mins/meditation)*

1-2 minutes *(1.5 mins/meditation)*

3-5 minutes *(4 mins/meditation)*

6-8 minutes *(7 mins/meditation)*

9-12 minutes *(10.5 mins/meditation)*

13-15 minutes *(14 mins/meditation)*

More than 15 minutes (please indicate) _____ *(x mins/meditation)*

Did you use any of the following apps or technologies to assist with your meditation (check all that apply)?

Insight Timer

Headspace

Muse

Buddhify

Calm

Mindfulness App

Other _____

The Mindful Lawyer Study 2 and the Mindful Grad Student†

On average, how many days did you meditate each week during the 30-day/4-week‡ program? _____

On average, how many minutes did you meditate each time you practiced?

_____

---

*Italicized text presented next to the response options specifies how responses were coded for the purpose of calculating a measure of program participation. This text was not displayed to participants during the survey. Program participation was calculated as minutes per week by multiplying coded responses for the first two participation questions together.

†Program participation was calculated as minutes per week by multiplying responses to the two questions together.

‡The Mindful Lawyer Study 2 and the Mindful Grad Student study employed 30-day and 4-week interventions, respectively. This phrase was, therefore, adjusted accordingly.

Appendix F. The Mindful Lawyer (Chapter 2)**:** Ethics approval.

Western Research

Research Ethics

Western University Non-Medical Research Ethics Board
NMREB Delegated Initial Approval Notice

Principal Investigator: Dr. John Paul Minda
Department & Institution: Social Science\Psychology,Western University

NMREB File Number: 107342
Study Title: Cognitive Benefits of Mindfulness Meditation
Sponsor: Social Sciences and Humanities Research Council

NMREB Initial Approval Date: November 24, 2015
NMREB Expiry Date: November 24, 2016

Documents Approved and/or Received for Information:

Document Name	Comments	Version Date
Recruitment Items	Recruitment for Psych volunteers	2015/10/15
Recruitment Items	Recruitment for paid	2015/10/22
Other	Instructions	2015/10/22
Instruments	Surveys	2015/10/22
Instruments	Cogntive Tasks	2015/10/22
Revised Western University Protocol		2015/11/10
Letter of Information & Consent	LOI+CONSENT SONA	2015/11/10
Letter of Information & Consent	LOI + CONSENT PAID	2015/11/10

The Western University Non-Medical Research Ethics Board (NMREB) has reviewed and approved the above named study, as of the NMREB Initial Approval Date noted above.

NMREB approval for this study remains valid until the NMREB Expiry Date noted above, conditional to timely submission and acceptance of NMREB Continuing Ethics Review.

The Western University NMREB operates in compliance with the Tri-Council Policy Statement Ethical Conduct for Research Involving Humans (TCPS2), the Ontario Personal Health Information Protection Act (PHIPA, 2004), and the applicable laws and regulations of Ontario.

Members of the NMREB who are named as Investigators in research studies do not participate in discussions related to, nor vote on such studies when they are presented to the REB.

The NMREB is registered with the U.S. Department of Health & Human Services under the IRB registration number IRB 00000941.

This is an official document. Please retain the original in your files

Appendix G. The Mindful Lawyer (Chapter 2) Study 2 and the Mindful Grad Student (Chapter 3): Continued practice questions.

In the month since the 30-day/4-week* program ended, have you continued to practice meditation?†

Yes

No

On average, how many times per week have you meditated in the last month?

_____

On average, how many minutes did you meditate each time you practiced?

_____

Did you use any of the following apps or technologies to assist with your meditation (check all that apply)?

Insight Timer

Headspace

Muse

Buddhify

Calm

Mindfulness App

Other _____

_____

*The Mindful Lawyer Study 2 and the Mindful Grad Student study employed 30-day and 4-week interventions, respectively. This phrase was, therefore, adjusted accordingly.

†Follow-up questions were only displayed if participants indicated that they had continued to practice meditation after the intervention had ended.

Appendix H. The Mindful Lawyer (Chapter 2) Study 2: Comparisons across all three time points.

In line with an analysis plan registered on OSF, 2 x 3 mixed ANOVAs were conducted for each measure with condition as a between-group factor and time as a within-group factor. Heteroscedasticity and violations of sphericity were addressed via white and epsilon corrections, respectively, and significant interactions were assessed via Holm-Bonferroni-corrected tests of simple main effects on time across condition (i.e., T1, T2, and T3 scores were compared for each condition separately using corrected one-way ANOVAs). Significant simple main effects were followed by Holm post-hoc tests.

Participant Attrition

As discussed in Section 2.3.2.2.1, the T1 to T2 attrition rate was 31.18%. Of the 64 participants ($n_{\text{Experimental}} = 25$) who responded to both the T1 and T2 surveys, 38 ($n_{\text{Experimental}} = 18$) provided responses to the T3 survey, resulting in a T2 to T3 attrition rate of 40.63%. An independent *t*-test indicated that the 38 participants who responded to all three assessments ($M = 50.50$, $SD = 9.85$) were significantly older than the 57 participants who responded to only one or two of the assessments ($M = 44.86$, $SD = 8.82$); $t(92) = -2.90$, $p = .005$, $d = -.61$. Responding was not found to be affected by gender, job position, size of one's home office, condition, length of time spent working in one's current position, number of hours per week spent working, or length of previous meditation experience; $\chi^2(1, N = 94) = .06$, $p = .81$, $V = .03$; $\chi^2_{\text{lr}}(4, N = 94) = 5.35$, $p = .25$, $V = .22$; $\chi^2_{\text{lr}}(2, N = 94) = 2.07$, $p = .35$, $V = .15$; $\chi^2(1, N = 95) = .03$, $p = .87$, $V = .02$; $z = -.18$, $p = .86$, $r = .02$; $z = 1.24$, $p = .22$, $r = .13$; and $z = 1.53$, $p = .13$, $r = .16$, respectively.

Modified Intention-to-Treat Analyses

One participant in the control condition was omitted from analyses involving the FFMQ-24 and the DASS-21 because they failed to respond to these scales in the T3 assessment. Consequently, n = 38 or 37 for the mITT analyses ($n_{\text{Experimental}}$ = 18); characteristics of these 38 participants are presented in Table H.1. None of the characteristics differed significantly across conditions among these participants; gender, $\chi^2(1, N = 38) = .05$, $p = .83$, $V = .04$; job position, $\chi^2_{\text{lr}}(4, N = 38) = 6.62$, $p = .16$, $V = .39$; size of home office, $\chi^2_{\text{lr}}(2, N = 38) = 3.17$, $p = .21$, $V = .25$; for age, $t(36) = -.89$, $p = .38$, $d = -.29$; length of time spent working in one's current position, $z = -1.67$, $p = .10$, $r = .27$; hours per week spent working, $t(36) = 1.09$, $p = .28$, $d = .35$; years of previous meditation experience, $z = -.36$, $p = .73$, $r = -.06$; and minutes per week spent meditating during the program, $z = -.85$, $p = .40$, $r = .14$. Score distributions for each outcome measure are presented in Figure H.1. Scales generally displayed adequate levels of internal consistency (i.e., $\alpha \geq .70$; see Table H.2), though Cronbach's alpha was found to be low for the experimental condition at T1 on the awareness subscale of the FFMQ-24 and across all time points on the anxiety subscale of the DASS-21.

Perceived Stress Scale

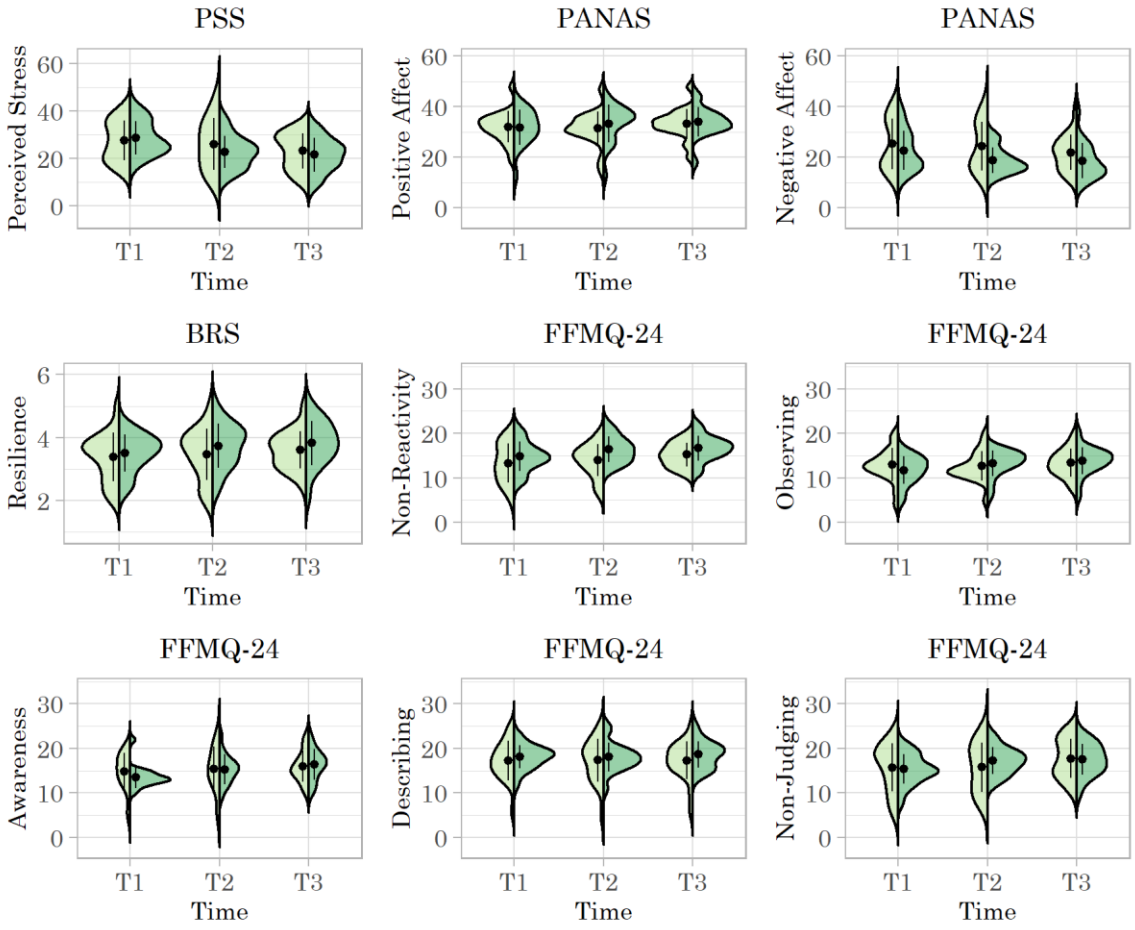
Neither the interaction nor the main effect of condition was found to be statistically significant; $F(2, 72) = 2.79$, $p = .07$, $\eta^2_G = .01$ and $F(1, 36) = .27$, $p = .61$, $\eta^2_G = .01$, respectively. The main effect of time, however, was significant; $F(2, 72) = 17.70$, $p < .001$, $\eta^2_G = .08$. Post-hocs further revealed that both T2 ($M = 24.55$, $SD = 9.19$) and T3 ($M = 22.42$, $SD = 7.21$) scores on the PSS were significantly lower than T1 scores ($M = 28.08$, $SD = 7.63$); $p_{\text{adj}} = .003$ and $p_{\text{adj}} < .001$, respectively. T3 scores were also found to be significantly lower than T2 scores; $p_{\text{adj}} = .04$.

Table H.1. The Mindful Lawyer Study 2 — Modified Intention-to-Treat Comparisons Across All Three Time Points: Participant characteristics.

	Control			Experimental			Overall		
Characteristic	n	M	SD	n	M	SD	n	M	SD
Age (Years)	20	49.15	10.98	18	52.00	8.47	38	50.50	9.85
Years in Current Position	20	8.88	9.88	17	12.35	8.71	37	10.47	9.40
Hrs/Week Worked	20	51.30	8.50	18	48.50	7.19	38	49.97	7.93
Previous Meditation Experience (Years)	18[a]	.19	.49	18	2.07	5.15	36	1.13	3.73
Meditation During the Program (Mins/Week)	20	38.50	44.45	18	34.56	19.01	38	36.63	34.42
Continued Meditation After Program Completion									
Yes (Mins/Week)		N/A		8	16.32	20.12			
No				10					
Gender									
Male	6			6			12		
Female	14			12			26		
Position									
Equity Shareholder	4			5			9		
Non-Equity Shareholder	5			8			13		
Of Counsel/Counsel	2			3			5		
Associate	7			2			9		
Other	2			0			2		
Size of Home Office									
< 10 Employees	0			2			2		
10 – 20 Employees	2			2			4		
> 20 Employees	18			14			32		

[a]Two control participants have been excluded because they indicated that they had 3+ years of meditation experience but failed to further specify the number of years of experience that they possessed.

Figure H.1. The Mindful Lawyer Study 2 — Modified Intention-to-Treat Comparisons Across All Three Time Points: Distributions of scores on each of the outcome measures.



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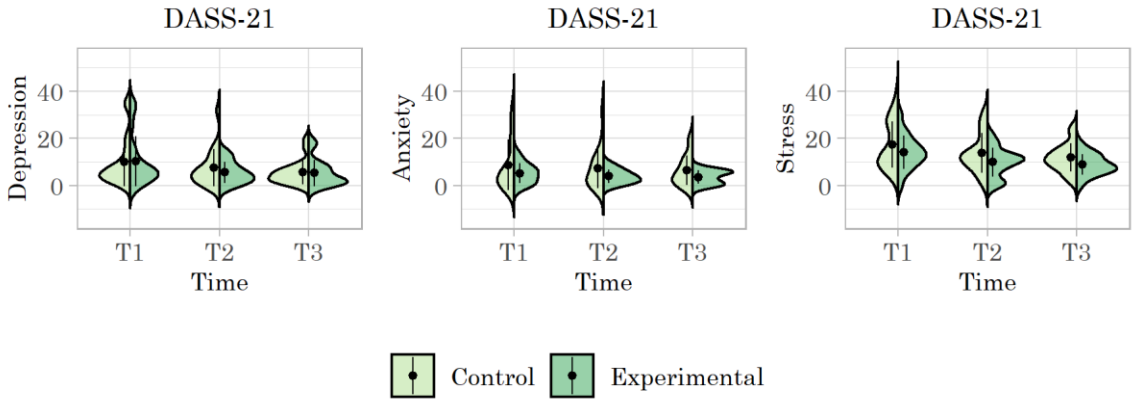
(Figure H.1 continued.)



Note. Score distributions are shown for the Perceived Stress Scale (PSS); the positive and negative affect subscales of the Positive and Negative Affect Schedule (PANAS); the Brief Resilience Scale (BRS); the non-reactivity, observing, awareness, describing, and non-judging subscales of the Five Facet Mindfulness Questionnaire-24 (FFMQ-24); and the depression, anxiety, and stress subscales of the Depression Anxiety Stress Scales-21 (DASS-21). Scores are depicted at Time 1 (T1), Time 2 (T2), and Time 3 (T3) for both the control (light green/grey) and experimental (dark green/grey) conditions. Dots and whiskers represent means and standard deviations, respectively.

Table H.2. The Mindful Lawyer Study 2 — Modified Intention-to-Treat Comparisons Across All Three Time Points: Internal consistency (α) of the scales used.

	Control Condition				Experimental Condition				Conditions Combined			
Measure	T1	T2	T3	Overall	T1	T2	T3	Overall	T1	T2	T3	Overall
Perceived Stress Scale												
	.92	.95	.91	.93	.90	.90	.88	.91	.91	.94	.90	.92
Positive and Negative Affect Schedule												
Positive Affect	.88	.93	.93	.91	.92	.94	.93	.93	.89	.93	.93	.92
Negative Affect	.92	.93	.93	.93	.92	.86	.93.	.91	.92	.92	.93	.92
Brief Resilience Scale												
	.89	.95	.88	.91	.87	.81	.90	.85	.88	.89	.89	.88
Five Facet Mindfulness Questionnaire-24												
Non-Reactivity	.91	.87	.77	.87	.84	.73	.81	.81	.88	.84	.79	.85
Observing	.88	.86	.90	.87	.81	.80	.76	.80	.85	.83	.83	.84
Awareness	.87	.92	.87	.89	.66	.82	.83	.80	.82	.88	.84	.86
Describing	.91	.95	.96	.94	.80	.88	.88	.85	.88	.93	.94	.91
Non-Judging	.92	.93	.92	.93	.79	.80	.82	.82	.88	.90	.88	.89
Depression Anxiety Stress Scales-21												
Depression	.94	.89	.83	.90	.95	.81	.88	.93	.94	.87	.85	.91
Anxiety	.91	.87	.86	.89	.64	.50	.34	.55	.87	.84	.81	.85
Stress	.88	.89	.82	.88	.86	.86	.72	.85	.88	.89	.80	.88

Note. T1 = Time 1, T2 = Time 2, and T3 = Time 3.

Positive and Negative Affect Schedule

Positive Affect. None of the effects were found to be statistically significant with respect to scores on the positive affect subscale of the PANAS; interaction, $F(2, 72) = 1.06$, $p = .35$, $\eta^2_G = .005$; main effect of condition, $F(1, 36) = .16$, $p = .69$, $\eta^2_G = .004$; and main effect of time; $F(2, 72) = 2.83$, $p = .07$, $\eta^2_G = .01$.

Negative Affect. Scores on the negative affect subscale of the PANAS displayed violations of the assumptions of both homoscedasticity and sphericity. A white correction was, therefore, applied to the test of condition and an epsilon correction ($\varepsilon_{HF} = .78$) was applied to the interaction and to the test of time. Neither the interaction nor the main effect of condition were found to be statistically significant; $F(1.56, 55.99) = 1.70$, $p = .20$, $\eta^2_G = .01$ and $F(1, 36) = 2.41$, $p = .13$, $\eta^2_G = .06$, respectively. The main effect of time, however, was significant; $F(1.56, 55.99) = 10.92$, $p < .001$, $\eta^2_G = .04$. Post-hocs further revealed that both T2 ($M = 21.76$, $SD = 8.23$) and T3 ($M = 20.37$, $SD = 7.03$) scores were significantly lower than T1 scores ($M = 24.11$, $SD = 8.96$); $p_{adj} = .002$ for both. A significant score difference was not observed between T2 and T3; $p_{adj} = .07$.

Brief Resilience Scale

Neither the interaction nor the main effect of condition was found to be statistically significant; $F(2, 72) = .39$, $p = .68$, $\eta^2_G = .002$ and $F(1, 36) = .95$, $p = .34$, $\eta^2_G = .02$, respectively. The main effect of time, however, was significant; $F(2, 72) = 5.65$, $p = .01$, $\eta^2_G = .03$. Post-hocs further revealed that T3 scores ($M = 3.71$, $SD = .65$) on the BRS were significantly higher than T1 scores ($M = 3.44$, $SD = .68$); $p_{adj} = .002$. Significant score differences were not observed between T1 and T2 ($M = 3.60$, $SD = .65$) or T2 and T3; $p_{adj} = .11$ and $p_{adj} = .20$, respectively.

Five Facet Mindfulness Questionnaire-24

Non-Reactivity. Neither the interaction nor the main effect of condition was found to be statistically significant; $F(2, 70) = .64$, $p = .53$, $\eta^2_G = .01$ and $F(1, 35) = 3.63$, $p = .06$, $\eta^2_G = .07$, respectively. The main effect of time, however, was significant; $F(2, 70) = 7.17$, $p = .002$, $\eta^2_G = .05$. Post-hocs further revealed that T3 scores ($M = 15.92$, $SD = 2.78$) on the non-reactivity subscale of the FFMQ-24 were significantly higher than T1 scores ($M = 14.03$, $SD = 3.93$); $p_{adj} = .01$. Significant score differences were not observed between T1 and T2 ($M = 15.14$, $SD = 3.49$) or T2 and T3; $p_{adj} = .08$ for both.

Observing. Scores on the observing subscale of the FFMQ-24 displayed a violation of the assumption of sphericity. An epsilon correction ($\varepsilon_{GG} = .75$) was, therefore, applied to the interaction and to the test of time. Neither the interaction nor the main effect of condition were found to be statistically significant; $F(1.50, 52.34) = 3.43$, $p = .05$,* $\eta^2_G = .02$ and $F(1, 35) = .002$, $p = .97$, $\eta^2_G < .001$, respectively. The main effect of time, however, was significant; $F(1.50, 52.34) = 4.98$, $p = .02$, $\eta^2_G = .03$. Post-hocs further revealed that T3 scores ($M = 13.59$, $SD = 3.08$) were significantly higher than T1 scores ($M = 12.35$, $SD = 3.45$); $p_{adj} = .04$. Significant score differences were not observed between T1 and T2 ($M = 12.95$, $SD = 3.09$) or T2 and T3; $p_{adj} = .11$ and $p_{adj} = .13$, respectively.

Acting with Awareness. Neither the interaction nor the main effect of condition was found to be statistically significant; $F(2, 70) = 1.33$, $p = .27$, $\eta^2_G = .01$ and $F(1, 35) = .09$, $p = .77$, $\eta^2_G = .002$, respectively. The main effect of time, however, was significant; $F(2, 70) = 9.00$, $p < .001$, $\eta^2_G = .05$. Post-hocs further revealed that both T2 ($M = 15.35$, $SD = 4.22$) and T3 ($M = 16.16$, $SD =$

*This number has been rounded to two decimal places but is, in fact > .05.

3.45) scores on the awareness subscale of the FFMQ-24 were significantly higher than T1 scores (M = 14.16, SD = 3.52); p_{adj} = .01 and p_{adj} < .001, respectively. A significant score difference was not observed between T2 and T3; p_{adj} = .12.

Describing. None of the effects were found to be statistically significant with respect to scores on the describing subscale of the FFMQ-24; interaction, F(2, 70) = .21, p = .81, η^2_G = .001; main effect of condition, F(1, 35) = .76, p = .39, η^2_G = .02; and main effect of time; F(2, 70) = .19, p = .83, η^2_G = .001.

Non-Judging. Scores on the non-judging subscale of the FFMQ-24 displayed a violation of the assumption of homoscedasticity. A white correction was, therefore, applied to the test of condition. Neither the interaction nor the main effect of condition was found to be statistically significant; F(2, 70) = 2.08, p = .13, η^2_G = .01 and F(1, 35) = .04, p = .83, η^2_G = .001, respectively. The main effect of time, however, was significant; F(2, 70) = 9.31, p < .001, η^2_G = .04. Post-hocs further revealed that T3 scores (M = 17.62, SD = 3.93) were significantly higher than T1 scores (M = 15.51, SD = 4.46); p_{adj} = .001. Significant score differences were not observed between T1 and T2 (M = 16.49, SD = 4.49) or T2 and T3; p_{adj} = .06 for both.

Depression Anxiety Stress Scales-21

The spread of participants across each of the DASS-21 severity categories is outlined in Table H.3. At T1, both conditions reported anxiety and stress symptoms of above-normal severity at higher rates than in Krill et al. (2016; see Table 2.6); participants in the waitlist control condition also reported higher rates of above-normal depression symptoms. Between condition comparisons further suggest that the waitlist control condition began the study with more severe levels of depression, anxiety, and stress than the experimental condition. However, symptom severity seems to have declined over time in both conditions and, by T3, larger proportions of both participant

Table H.3. The Mindful Lawyer Study 2 — Modified Intention-to-Treat Comparisons Across All Three Time Points: Percentage of participant responses on the Depression Anxiety Stress Scales-21 that fall in each of the symptom severity categories.

	Depression			Anxiety			Stress		
Symptom Severity	Time 1	Time 2	Time 3	Time 1	Time 2	Time 3	Time 1	Time 2	Time 3
Control Condition[a]									
Normal	65.00	70.00	84.21	60.00	55.00	63.16	55.00	70.00	73.68
Mild	10.00	5.00	5.26	10.00	5.00	5.26	5.00	.00	15.79
Moderate	10.00	20.00	10.53	.00	25.00	21.05	5.00	15.00	10.53
Severe	5.00	.00	.00	15.00	.00	.00	30.00	15.00	.00
Extremely Severe	10.00	5.00	.00	15.00	15.00	10.53	5.00	.00	.00
Experimental Condition[b]									
Normal	72.22	77.78	83.33	66.67	83.33	94.44	55.56	83.33	94.44
Mild	.00	11.11	5.56	16.67	11.11	5.56	22.22	11.11	5.56
Moderate	11.11	11.11	11.11	16.67	5.56	.00	16.67	5.56	.00
Severe	5.56	.00	.00	.00	.00	.00	5.56	.00	.00
Extremely Severe	11.11	.00	.00	.00	.00	.00	.00	.00	.00

Note. [a]at Time 1 and 2, $n = 20$; at Time 3, $n = 19$. [b]$n = 18$.

groups fell within the normal range on the depression subscale than the participants in Krill et al. (2016). The experimental condition also showed lower T3 rates of non-normal levels of anxiety and stress compared to the sample from Krill et al; participants in the waitlist control condition, however, seem to have experienced smaller improvements on these subscales than the experimental condition.

Depression. Scores on the depression subscale of the DASS-21 displayed a violation of the assumption of sphericity. An epsilon correction ($\varepsilon_{HF} = .88$) was, therefore, applied to the interaction and to the test of time. Neither the interaction nor the main effect of condition were found to be statistically significant; $F(1.76, 61.47) = .48$, $p = .60$, $\eta^2_G = .004$ and $F(1, 35) = .12$, $p = .73$, $\eta^2_G = .003$, respectively. The main effect of time, however, was significant; $F(1.76, 61.47) = 8.98$, $p < .001$, $\eta^2_G = .06$. Post-hocs further revealed that both T2 ($M = 6.59$, $SD = 6.46$) and T3 ($M = 5.51$, $SD = 5.30$) scores were significantly lower than T1 scores ($M = 10.16$, $SD = 10.35$); $p_{adj} = .02$ and $p_{adj} < .001$, respectively. A significant score difference was not observed between T2 and T3; $p_{adj} = .23$.

Anxiety. Scores on the anxiety subscale of the DASS-21 displayed a violation of the assumption of homoscedasticity. A white correction was, therefore, applied to the test of condition. None of the effects were found to be statistically significant; interaction, $F(2, 70) = .05$, $p = .95$, $\eta^2_G < .001$; main effect of condition, $F(1, 35) = 2.90$, $p = .10$, $\eta^2_G = .08$; and main effect of time; $F(2, 70) = 2.50$, $p = .09$, $\eta^2_G = .02$.

Stress. Neither the interaction nor the main effect of condition was found to be statistically significant; $F(2, 70) = .15$, $p = .86$, $\eta^2_G < .001$ and $F(1, 35) = 2.59$, $p = .12$, $\eta^2_G = .06$, respectively. The main effect of time, however, was significant; $F(2, 70) = 17.03$, $p < .001$, $\eta^2_G = .09$. Post-hocs further revealed

that both T2 (M = 11.95, SD = 7.62) and T3 (M = 10.43, SD = 5.46) scores were significantly lower than T1 scores (M = 15.78, SD = 8.69); $p_{adj} < .001$ for both. A significant score difference was not observed between T2 and T3; $p_{adj} = .10$.

Per-Protocol Analyses

Of the 38 participants who responded to all three assessments, one in the experimental condition indicated that they did not meditate at all throughout the program. For PP analyses, therefore, n = 37 or 36 ($n_{Experimental}$ = 17). PP analyses deviated from mITT analyses with respect to both the PSS and the observing subscale of the FFMQ-24 (see Figure H.2). All other results from PP analyses were found to be comparable to the results from mITT analyses.

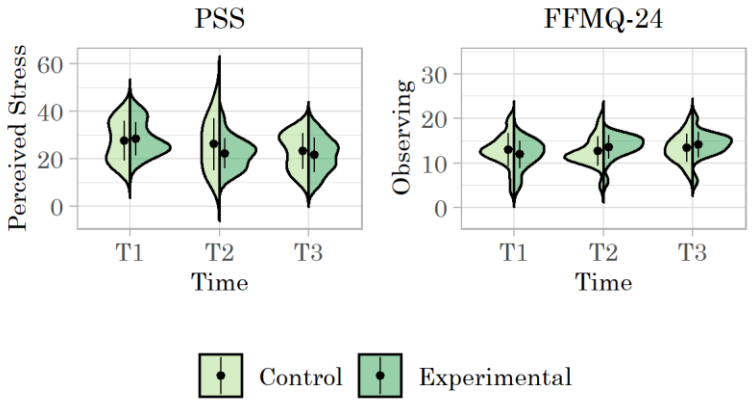
Perceived Stress Scale

As in mITT analyses, PP analyses revealed that both T2 (M = 24.30, SD = 9.18) and T3 (M = 22.43, SD = 7.31) scores on the PSS were significantly lower than T1 scores (M = 27.89, SD = 7.65); $p_{adj} = .003$ and $p_{adj} < .001$, respectively. Unlike mITT analyses, however, PP analyses revealed no significant difference between T2 and T3 scores; $p_{adj} = .07$. PP results regarding the interaction and the main effect of condition were comparable to mITT results.

Five Facet Mindfulness Questionnaire-24

Observing. Scores on the observing subscale displayed a violation of the assumption of sphericity. An epsilon correction ($\varepsilon_{GG} = .73$) was, therefore, applied to the interaction and to the test of time. Unlike mITT analyses, PP analyses exhibited a significant interaction; $F(1.47, 49.84) = 3.83$, $p = .04$, $\eta^2_G = .02$. Tests of simple main effects — which also employed epsilon corrections (experimental, $\varepsilon_{GG} = .67$; control, $\varepsilon_{GG} = .73$) — found a significant main effect

Figure H.2. The Mindful Lawyer Study 2 — Per-Protocol Comparisons Across All Three Time Points: Distributions of scores on the Perceived Stress Scale (PSS) and the observing subscale of the Five Facet Mindfulness Questionnaire-24 (FFMQ-24).



Note. Scores are depicted at Time 1 (T1), Time 2 (T2), and Time 3 (T3) for both the control (light green/grey) and experimental (dark green/grey) conditions. Dots and whiskers represent means and standard deviations, respectively.

of time for the experimental condition but not for the control condition; $F(1.41, 22.54) = 9.65$, $p_{adj} = .005$, $\eta^2_G = .10$ and $F(1.57, 28.23) = .78$, $p_{adj} = .44$, $\eta^2_G = .01$, respectively. Post-hocs further revealed that, for participants in the experimental condition, both T2 ($M = 13.59$, $SD = 2.62$) and T3 ($M = 14.12$, $SD = 2.91$) scores were significantly higher than T1 scores ($M = 11.88$, $SD = 3.12$); $p_{adj} < .001$ and $p_{adj} = .01$, respectively. A significant experimental score difference was not observed between T2 and T3; $p_{adj} = .31$.

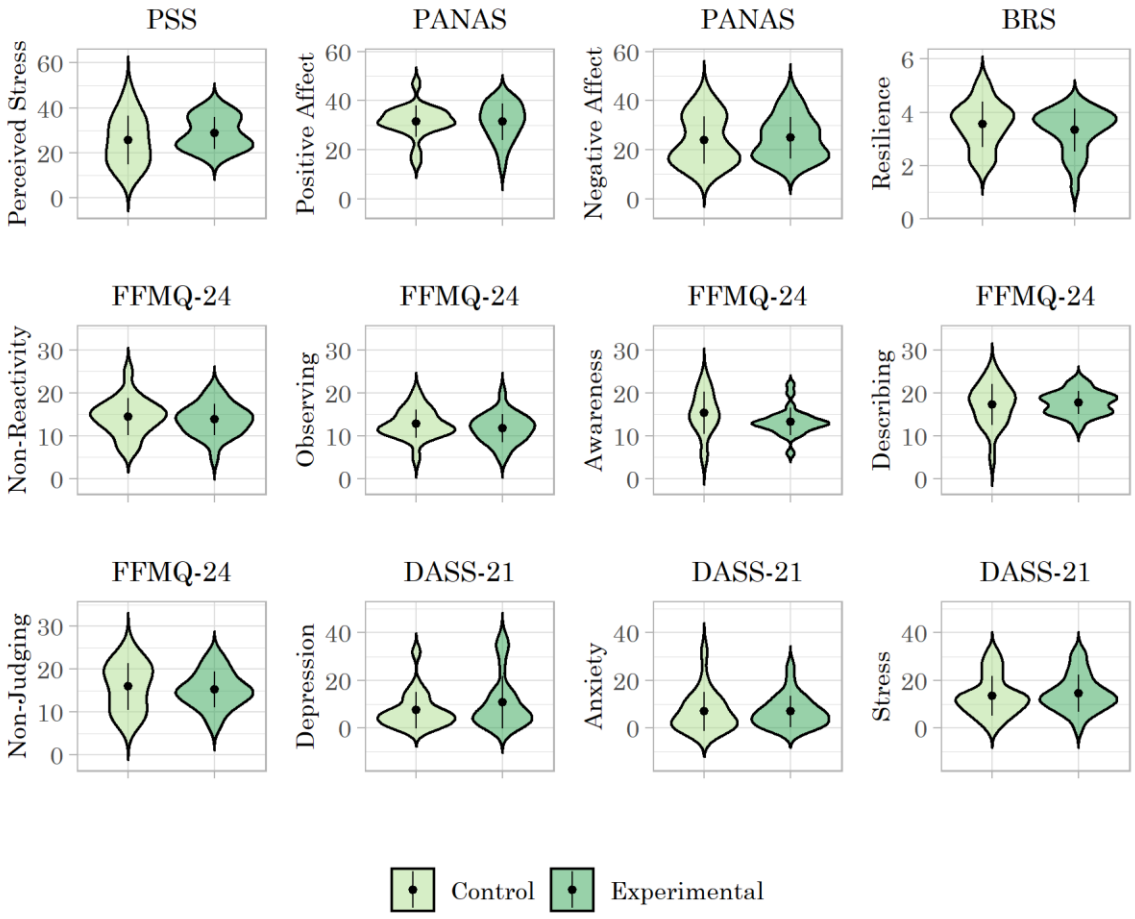
Appendix I. The Mindful Lawyer (Chapter 2) Study 2: Supplementary analyses.

In Chapter 2, Study 2, experimental participants seem to have displayed more program-related changes than participants in the waitlist control condition in both mITT and PP analyses. The following analyses explore some of the potential explanations for this discrepancy, including between-group differences in participant characteristics and variations in pre-intervention baselines. Participant characteristics were compared across conditions using Pearson or likelihood ratio chi-square tests and independent *t*-tests or Wilcoxon-Mann-Whitney tests. Independent *t*-tests/Wilcoxon-Mann Whitney tests were also used to perform between-group comparisons on pre-intervention scores (i.e., experimental T1 scores vs. control T2 scores). For independent *t*-tests, heteroscedasticity was addressed via Welch adjustments.

Modified Intention-to-Treat

mITT comparisons included the 25 experimental participants from the T2 comparison analyses in Section 2.3.2.2.2 and the 21 (or 20) waitlist control participants from the T2 and T3 comparison analyses in Section 2.3.2.3.2. Therefore, n = 46 (or 45); characteristics of the experimental and control participants are presented in tables 2.8 and 2.11, respectively. None of the characteristics differed significantly across conditions among these participants; gender, $\chi^2(1, N = 46) = .55$, $p = .46$, $V = .11$; job position, $\chi^2_{lr}(4, N = 46) = 6.99$, $p = .14$, $V = .37$; size of home office, $\chi^2_{lr}(2, N = 46) = 3.10$, $p = .21$, $V = .23$; age, $t(44) = -.34$, $p = .74$, $d = -.10$; length of time spent working in one's current position, $z = -1.92$, $p = .06$, $r = -.29$; hours per week spent working, $t(44) = .80$, $p = .43$, $d = .24$; years of previous meditation experience, $z = -.96$, $p = .34$, $r = -.14$; and minutes per week spent meditating during the program, $z = -.76$, $p = .45$, $r = -.11$. Pre-intervention score distributions for each outcome measure are presented in Figure I.1.

Figure I.1. The Mindful Lawyer Study 2 — Modified Intention-to-Treat Supplementary Analyses: Distributions of pre-intervention scores on each of the outcome measures



Note. Score distributions are shown for the Perceived Stress Scale (PSS); the positive and negative affect subscales of the Positive and Negative Affect Schedule (PANAS); the Brief Resilience Scale (BRS); the non-reactivity, observing, awareness, describing, and non-judging subscales of the Five Facet Mindfulness Questionnaire-24 (FFMQ-24); and the depression, anxiety, and stress subscales of the Depression Anxiety Stress Scales-21 (DASS-21). For participants in the control condition (light green/grey), pre-intervention refers to Time 2. For participants in the experimental condition (dark green/grey), pre-intervention refers to Time 1. Dots and whiskers represent means and standard deviations, respectively.

Pre-Intervention Comparisons

Perceived Stress Scale. Pre-intervention scores on the PSS did not differ between conditions; $t(33.38) = -1.17$, $p = .25$, $d = -.35$.

Positive and Negative Affect Schedule. Pre-intervention scores on the positive and negative affect subscales of the PANAS did not differ between conditions; $t(44) = .10$, $p = .92$, $d = .03$ and $z = -.56$, $p = .58$, $r = -.08$, respectively.

Brief Resilience Scale. Pre-intervention scores on the BRS did not differ between conditions; $z = .83$, $p = .41$, $r = .12$.

Five Facet Mindfulness Questionnaire-24. Participants in the control condition ($M = 15.35$, $SD = 4.89$) began the program with significantly higher scores on the awareness subscale of the FFMQ-24 than participants in the experimental condition ($M = 13.32$, $SD = 3.15$); $z = 2.02$, $p = .04$, $r = .30$. Pre-intervention scores on the non-reactivity, observing, describing, and non-judging subscales of the FFMQ-24 did not differ between conditions; $t(43) = .55$, $p = .58$, $d = .17$; $t(43) = 1.04$, $p = .30$, $d = .31$; $t(43) = -.37$, $p = .71$, $d = -.11$; and $t(43) = .50$, $p = .62$, $d = .15$, respectively.

Depression Anxiety Stress Scales-21. Pre-intervention scores on the depression, anxiety, and stress subscales of the DASS-21 did not differ between conditions; $z = -.91$, $p = .37$, $r = -.14$; $z = -.46$, $p = .65$, $r = -.07$; and $t(43) = -.44$, $p = .66$, $d = -.13$, respectively.

Moderation of Change Over Time

Because the groups included in mITT analyses began the intervention with different levels of awareness, analyses were conducted to determine whether the change in each outcome measure was moderated by pre-intervention

scores on the awareness subscale of the FFMQ-24. Moderation analyses were conducted as in Section 2.2.2.2. Change over time was calculated as post-intervention scores – pre-intervention scores (i.e., for experimental participants, T2 – T1 and, for waitlist control participants, T3 – T2). The moderating effect of pre-intervention awareness was then assessed for each measure with separate regression analyses. The results of these analyses are presented in Table I.1.

Pre-intervention awareness was found to be a significant moderator of change in scores on the PSS, the positive affect subscale of the PANAS, the BRS, the observing and awareness subscales of the FFMQ-24, and the depression and stress subscales of the DASS-21 (see Figure I.2). In particular, higher levels of pre-intervention awareness were found to be associated with less negative change (i.e., smaller decreases) on the PSS and the DASS-21 depression and stress subscales and less positive change (i.e., smaller increases) on the PANAS positive affect subscale, the BRS, and the FFMQ-24 observing and awareness subscales. Results were unchanged by the removal of two outliers corresponding to pre-intervention scores of 5 and 24 on the awareness subscale.

Per-Protocol Analyses

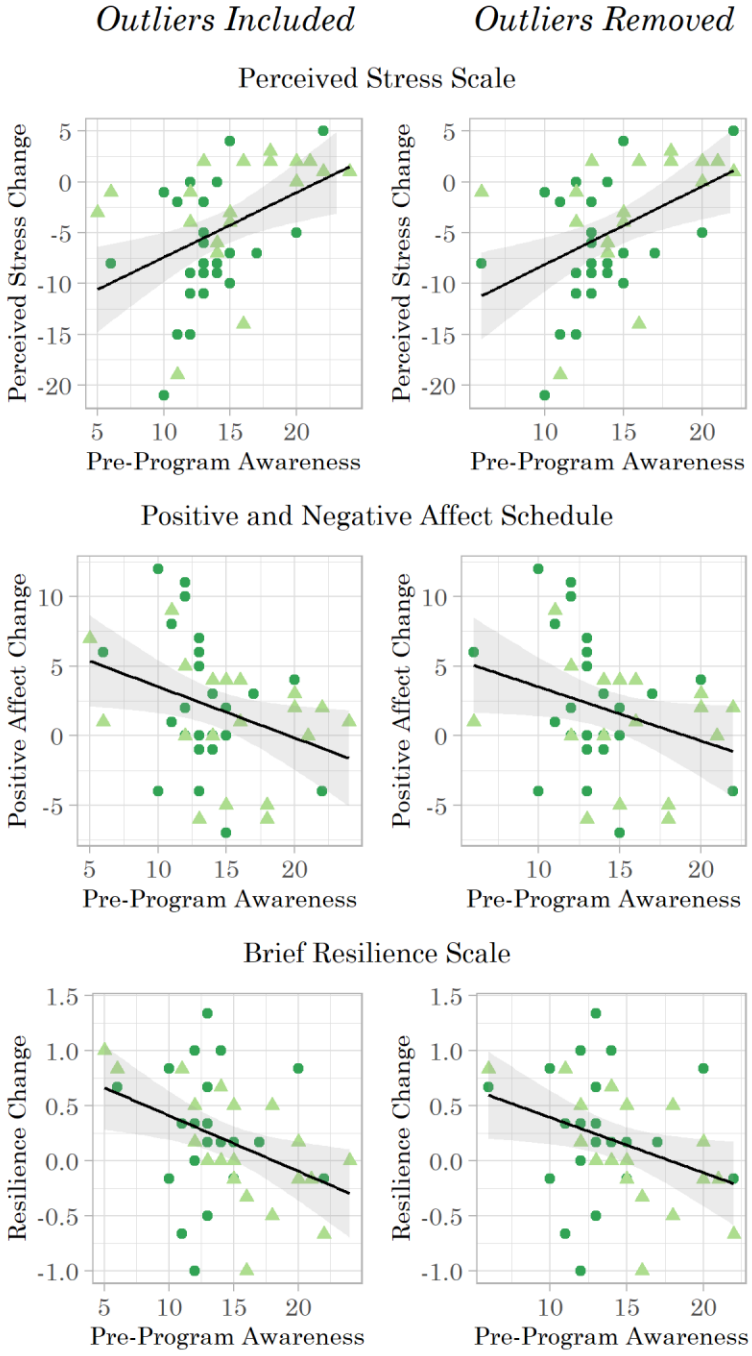
PP comparisons included the 24 experimental participants from the T2 comparison analyses in Section 2.3.2.2.3 and the 21 (or 20) waitlist control participants from the T2 and T3 comparison analyses in Section 2.3.2.3.3. Therefore, n = 45 (or 44). Whereas conditions in mITT analyses did not differ with respect to participant characteristics, experimental participants from PP analyses (M = 12.84, SD = 8.36) were found to have worked in their current position significantly longer than waitlist control participants (M = 8.69, SD = 9.66); z = -2.05, p = .04, r = .31. Participants from PP analyses displayed no significant difference in pre-intervention awareness scores (see

Table I.1. The Mindful Lawyer Study 2 — Modified Intention-to-Treat Supplementary Analyses: Change over time moderated by pre-intervention levels of awareness.

	All Participants[a]				Outliers Removed[b]			
Measure	R^2	F	p	B	R^2	F	p	B
Perceived Stress Scale								
	.18	9.55	.004*	.64	.21	10.63	.002*	.77
Positive and Negative Affect Schedule								
Positive Affect	.11	5.21	.03*	-.37	.09	4.20	.05*	-.39
Negative Affect	.09	4.06	.05[c]	.33	.08	3.66	.06	.37
Brief Resilience Scale								
	.14	7.28	.01*	-.05	.11	5.27	.03*	-.05
Five Facet Mindfulness Questionnaire-24								
Non-Reactivity	.06	2.59	.11	-.20	.06	2.70	.11	-.23
Observing	.35	23.28	< .001*	-.33	.35	21.86	< .001*	-.38
Awareness	.35	23.41	< .001*	-.48	.27	15.44	< .001*	-.45
Describing	.08	3.68	.06	-.19	.08	3.51	.07	-.21
Non-Judging	.08	3.99	.05[c]	-.23	.01	.42	.52	-.08
Depression Anxiety Stress Scales-21								
Depression	.09	4.17	.05*	.49	.13	6.17	.02*	.68
Anxiety	.01	.29	.59	.12	.05	2.08	.16	.36
Stress	.16	8.04	.01*	.55	.16	7.71	.01*	.62

Note. For participants in the experimental condition, pre-intervention refers to Time 1 and change was calculated as Time 2 – Time 1. For participants in the control condition, pre-intervention refers to Time 2 and change was calculated as Time 3 – Time 2. [a]$df = 1, 43$. [b]$df = 1, 41$. [c]This number has been rounded to two decimal places but is, in fact, > .05. *$p \leq .05$.

Figure I.2. The Mindful Lawyer Study 2 — Modified Intention-to-Treat Supplementary Analyses: Changes in perceived stress, positive affect, resilience, observing, awareness, depression, and stress as a function of pre-intervention awareness.



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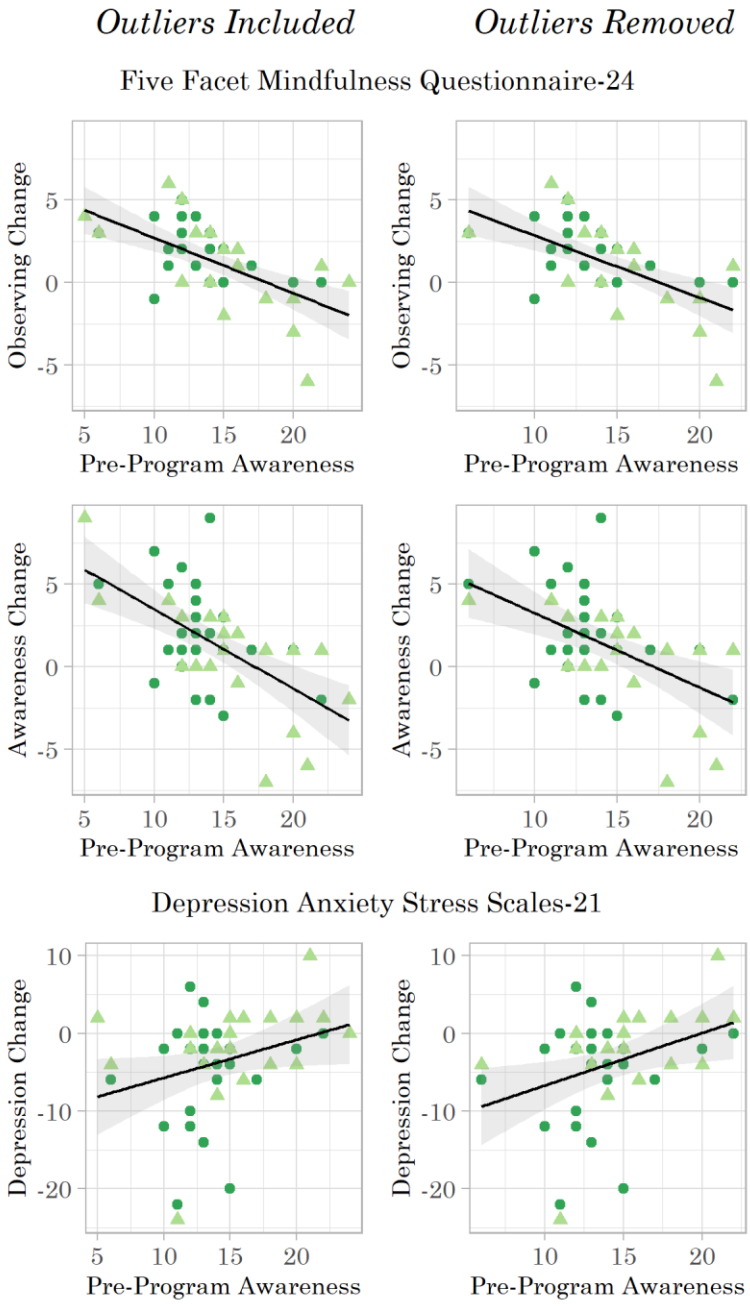
(Figure I.2 continued.)



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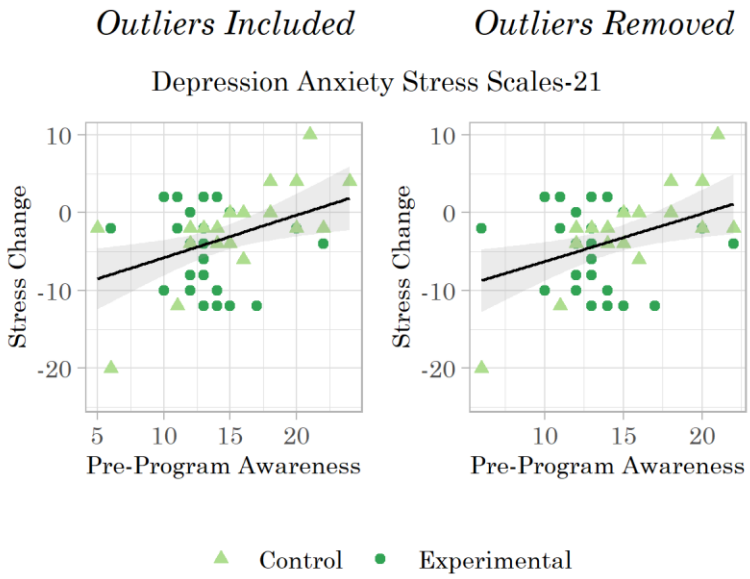
(Figure I.2 continued.)



Note. Figures depict the moderating relationship between pre-intervention scores on the awareness subscale of the Five Facet Mindfulness Questionnaire-24 and changes in scores on the Perceived Stress Scale, the positive affect subscale of the Positive and Negative Affect Schedule, the Brief Resilience Scale, the observing and awareness subscales of the Five Facet Mindfulness Questionnaire-24, and the depression and stress subscales of the Depression Anxiety Stress Scales-21 both before (left) and after (right) outlier removal. For participants in the control condition (light green/grey triangles), pre-intervention scores refer to Time 2 scores and change was calculated as T3 – T2. For participants in the experimental condition (dark green/grey circles), pre-intervention refers to Time 1 and change was calculated as T2 – T1. The shaded area represents a 95% confidence region.

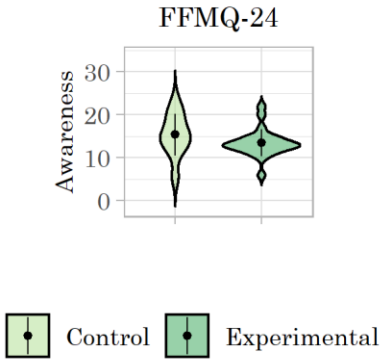
Figure I.3); $z = 1.90$, $p = .06$, $r = .29$. All other results from PP analyses were found to be comparable to the results from mITT analyses.

Moderation of Change Over Time

Because the groups included in PP analyses differed in the number of years they had spent working in their current position, analyses were conducted to determine whether the change in each outcome measure was moderated by position length. The results of these analyses are presented in Table I.2.

Length of time spent working in one's current position was found to be a significant moderator of change in scores on the BRS. In particular, a longer time spent working in one's current position was found to be associated with more positive change (i.e., larger increases) on the BRS (see Figure I.4). With respect to position length, there were no outlier values.

Figure I.3. The Mindful Lawyer Study 2 — Per-Protocol Supplementary Analyses: Distributions of pre-intervention scores on the awareness subscale of the Five Facet Mindfulness Questionnaire-24 (FFMQ-24).



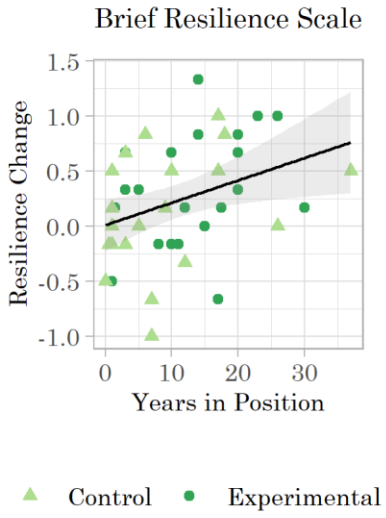
Note. For participants in the control condition (light green/grey), pre-intervention refers to Time 2. For participants in the experimental condition (dark green/grey), pre-intervention refers to Time 1. Dots and whiskers represent means and standard deviations, respectively.

Table I.2. The Mindful Lawyer Study 2 — Per-Protocol Supplementary Analyses: Change over time moderated by number of years spent working in one's current position.

Measure	R^2	F	p	B
Perceived Stress Scale[a]				
	< .001	.02	.89	-.01
Positive and Negative Affect Schedule[a]				
Positive Affect	.05	2.37	.13	-.12
Negative Affect	.02	.90	.35	-.07
Brief Resilience Scale[a]				
	.13	6.06	.02*	.02
Five Facet Mindfulness Questionnaire-24[b]				
Non-Reactivity	.01	.40	.53	-.04
Observing	< .001	.02	.88	.01
Awareness	.08	3.65	.06	.10
Describing	.04	1.86	.18	.06
Non-Judging	.09	4.06	.05[c]	.11
Depression Anxiety Stress Scales-21[b]				
Depression	< .001	< .001	.98	.003
Anxiety	.02	.94	.34	-.10
Stress	.03	1.03	.32	-.10

Note. Experimental change was calculated as Time 2 – Time 1. Control change was calculated as Time 3 – Time 2. [a]$df = 1, 41$. [b]$df = 1, 40$. [c]This number has been rounded to two decimal places but is, in fact, > .05. *$p \leq .05$.

Figure I.4. The Mindful Lawyer Study 2 — Per-Protocol Supplementary Analyses: Changes in resilience as a function of years spent working in one's current position



Note. The figure depicts the moderating relationship between years spent in one's current position and changes in scores on the Brief Resilience Scale. For participants in the control condition (light green/grey triangles), change was calculated as T3 – T2. For participants in the experimental condition (dark green/grey circles), change was calculated as T2 – T1. The shaded area represents a 95% confidence region.

Appendix J. The Mindful Grad Student (Chapter 3): The intervention.

The Mindful Grad Student study employed a 4-week, online intervention that was adapted from the 8-week program outlined in Cho and Gifford's (2016) book, *The Anxious Lawyer*. The four modules from the adapted program are outlined below.

Module 1

In Module 1, participants were asked to complete the Week 1 formal practice outlined in Table 2.1. They were also asked to read the following text, which was adapted from the "Beginning to Meditate" section in *The Anxious Lawyer* (pp. 37 – 59).

Introduction to the Program

Much of our mental time is spent in either the past (e.g., remembering things or events) or the future (e.g., thinking of potential outcomes and making plans). Physically, however, we exist in the present. One of the primary goals of a mindfulness practice is to help one better experience and be aware of the present as it unfolds.

Although they are related, mindfulness and meditation are separate constructs. In particular, mindfulness is a *state of awareness* that can be achieved by purposefully and nonjudgmentally paying attention to the present moment. Meditation is an *activity* that promotes self-directed consciousness and that can be used to evoke a state of mindfulness. During this program, you will learn about and practice some basic mindfulness-related meditation techniques.

Prior to beginning the program, spend some time thinking about the following:

- ***Where*** *to practice*. Before you begin meditating, make sure that you are comfortable and that you are in a physical position that you can sustain with minimal movement for the duration of your practice. For example, you may choose to sit in a comfortable chair or lie on the floor. It is also important to ensure that you are in a quiet environment where you can complete your meditation practice without being disturbed. To help turn your meditation practice into a daily habit, it may be useful to meditate in the same place each day, although it is not required to do so.

- ***When*** *to practice*. To further develop your meditation habit, you may find it helpful to practice at the same time each day. Try to find a time during which you can prepare yourself and complete your meditation without rushing.

- ***Length*** *of daily practice*. As part of this meditation program, we would like for you to try to meditate at least once per day. If you would like to meditate more often though, you are welcome to do so. The meditations presented in this program are of varying lengths. Each week, a new meditation topic will be unlocked. Once a week has been unlocked, it will remain unlocked for the duration of the study. Consequently, you may return to the previous weeks' pages and repeat past meditation activities as you wish. Note, however, that at the end of the program you will be asked to report approximately how often and for how long you meditated each week. You may find it helpful, therefore, to keep a log of your meditation practice throughout the program. Please also record any additional mindfulness activities that you partake in (i.e., if you use a mindfulness app or listen to guided meditations via an alternate source).

Beginning to Meditate

We will begin the program by practicing a meditation that is often used as an introductory mindfulness activity: the Body Scan meditation.

The mind is a busy thing and, though we are often aware of the thoughts and ideas that it produces, we don't typically take the time to observe the mind as it exists in a quiet and relaxed state. Meditation can provide you with an opportunity to engage in self-observation by calming and focusing the mind. Since the mind is used to being active, this can be a very challenging process. It is helpful, therefore, to have something that you can direct your mind and your attention towards. In this week's Body Scan meditation, you will be asked to focus your attention on the physical sensations that you feel in different parts of the body. For example, you may observe the sensation of your breath as it flows in and out of your chest or, perhaps, you may notice the feeling in your thighs as they press into the seat of your chair. When your mind begins to wander — which it undoubtedly will — simply observe what you are thinking about, let the thought go, and return your attention to the physical sensations in your body. In this way, bodily sensations can be used to ground and focus your attention so that the mind may become peaceful and still.

As you build your meditation practice, you may find it helpful to maintain an open and curious attitude towards the self. Imagine that you are a scientist, studying your own mind. Meditation is a wonderful tool to use for increasing self-knowledge and awareness.

Remember, there is no "right" way to meditate and it may take some time to get used to the process. Like other skills, mindfulness and

meditation are abilities that gradually develop over time. This is why it is referred to as a mindfulness meditation practice.

Two versions of the Body Scan meditation are available below. We recommend that you begin by practicing the short (6 minute) Body Scan meditation at the beginning of the week and move on to the longer (24 minute) Body Scan meditation once you have had a chance to familiarize yourself with the meditation process. The meditations can be played directly through OWL or you can download the audio files for offline use.

Module 2

In Module 2, participants were asked to complete the Week 2 formal practice outlined in Table 2.1. They were also asked to read the following text, which was adapted from the "Mindfulness" section in *The Anxious Lawyer* (pp. 61 – 87):

Mindfulness

As we've discussed, mindfulness is a state of awareness that can be achieved by purposefully paying attention to the present moment. Being fully engaged in the present, however, can be a very challenging process. In part, this is because we are accustomed to being active. We spend much of our time thinking, planning, remembering, and evaluating. With so much to do, the idea of taking a moment to just *be* can be guilt-provoking for some while, for others, spending time in the present moment may evoke boredom. Devoting too much mental time towards either the past or the future, however, can be detrimental. It can be easy for us to get carried away by memories from the past or to worry about what is to come in the future. In some cases, becoming preoccupied by such thoughts can lead to negative emotions and stress,

both of which can influence how we behave and interact with others. By intentionally grounding ourselves in the present, we can objectively view our thoughts and feelings for what they are: temporary ideas and emotional states that will eventually pass. Over time, we may also learn to identify the things that elicit or are associated with maladaptive thought patterns and emotions. In this way, a mindfulness practice may help us to become less reactive and more deliberately responsive in our actions.

Last week's Body Scan meditation encouraged us to become mindful of the physical sensations within the body. In this week's practice, we will focus specifically on sensations associated with the breath. The breath is both recurrent and continuous — features that make it a convenient attentional anchor with which one can ground themselves. Mindful breathing can be practiced anywhere, at any time and, when the mind begins to wander, one can simply refocus their attention on the next breath which is bound to come.

This week, in addition to practicing the meditation activity, see if you can adopt a mindful attitude in other areas of your life. Below are some suggestions for how you may do so:

- Try to identify moments in the past that have preceded a feeling of stress. Practice being mindful if you recognize similar events occurring. For example, try taking three, full breaths before reacting to a stressful situation.

- When you notice that you are feeling a strong emotion, try to also notice the physical sensations that you are feeling. For instance, you may recognize that your shoulders tense and your jaw clenches when you are angry.

- When you are eating, pay attention to the taste, texture, and smell of your food.

- Approach your meditation practice mindfully. Take some time to think about your experience last week and identify if there are any changes you could make to improve your experience this week. If you found yourself falling asleep during your practice, for example, try meditating at a different time of day and/or meditating seated on the floor without back support.

An 11-minute Breathing Focused meditation is available below. The meditation can be played directly through OWL or you can download the audio file for offline use.

Module 3

In Module 3, participants were asked to complete the Week 3 formal practice outlined in Table 2.1. They were also asked to read the following text, which was adapted from the "Clarity" section in *The Anxious Lawyer* (pp. 89 –108):

Clarity

Over the past two weeks, we have explored the body and the physical

process of breathing. This week, we'll explore the mind and the mental process of thinking.

Just as the body naturally breathes, the mind naturally thinks. Though thinking is a crucial skill that allows us to solve problems and make decisions, it can be easy to get caught up in thoughts and worries. We may also have a tendency to view our thoughts as reality. This can be problematic if our thoughts promote an unrealistic or negative view of the world, the self, and those around us. Adopting a

mindful approach towards thinking can help to remind us that our thoughts are simply a product of the mind. By observing our thoughts objectively, we can identify which ideas to believe and which to ignore. Furthermore, we may become better able to recognize the situations that provoke negative thought patterns and, in turn, challenge maladaptive thoughts. Bringing awareness to the thinking process can also help us to extend and appreciate those moments in which the mind is still and calm — that is, when we are experiencing clarity.

Last week's Breathing Focused meditation encouraged us to follow the breath. In this week's practice, we will focus on following our thoughts. Rather than paying attention to the content or quality of your thoughts, try to examine how each thought flows through the mind. It can be challenging to experience thoughts as an impartial observer so try to approach this practice with patience and a sense of openness. If you are having difficulty with this practice, you may find one of the following suggestions to be helpful:

- Rather than following each thought in its entirety, try focusing on a specific part of the thinking process. For instance, you may observe how a thought is formed. Does it materialize gradually or appear suddenly in its entirety? Is there a certain feeling associated with the beginning of a thought? Are your thoughts loud or quiet within the mind?

- If you find yourself evaluating your thoughts, try to classify them instead of judging them. For example, rather than identify your thoughts as "good" or "bad", label each as a wish, a memory, a plan or a decision.

An 11-minute Thought Focused meditation is available below. The meditation can be played directly through OWL or you can download the audio file for offline use.

Module 4

In Module 4, participants were asked to complete the Week 4 and 5 formal practices outlined in Table 2.1. They were also asked to read the following text, which was adapted from the "Compassion Toward Others" and "Self-Compassion" sections in *The Anxious Lawyer* (pp. 109 –135 and 137 –162, respectively):

Compassion

Now that you have had a chance to familiarize yourself with some basic mindfulness techniques, we'll move to a more challenging exercise: offering compassion to both others and the self.

Before we begin, let's consider what we mean by "compassion." Compassion is not the same as offering forgiveness or pity and it does not require that you give in to, agree with, or even like the individual who you are feeling compassionate towards. Instead, compassion is:

(1) Recognizing difficulties that we or others may be facing;

(2) Acknowledging that difficulties are a natural component of the human experience;

(3) Connecting with our innate desire to help and care for those who are suffering; and

(4) Taking action to demonstrate our sense of caring and, when possible, to alleviate the pain that we or others are feeling.

Compassion, therefore, encourages us to view others as human beings who, like us, live complex lives and are capable of feeling a wide range of emotions. In turn, this practice can allow us to have more meaningful interactions with those around us. Compassion can also promote a more positive relationship with the self. In particular, self-directed compassion can be useful for confronting any negative perceptions or unrealistic expectations that we hold for ourselves. We are bound to encounter situations, for instance, in which we are unsuccessful despite trying our hardest to succeed. In situations such as these, self-compassion can help us to challenge any negative thoughts that may arise (e.g., "I'm such a failure," "I always screw things up for myself," etc.) by encouraging us to realize that challenges are a natural and temporary part of life. Furthermore, by recognizing the humanity that we possess and share with others, compassion can remind us that, in times of suffering, we are not alone.

We all possess the innate ability to be compassionate. The goal of this week's practice is to strengthen this ability and learn to practice compassion in a more mindful and purposeful way. As previously mentioned, however, this can be a very difficult exercise. For this reason, we recommend that you begin this week by practicing the Compassion Towards Others (11 minute) meditation. Start your practice by offering compassionate thoughts towards someone who you find it easy to be compassionate towards (i.e., someone you love or care for). As you become more familiar with this exercise over time, you may expand your practice by offering compassion towards a stranger (e.g., a bus driver or cashier you've encountered), someone you are having difficulties with and, ultimately, larger groups of people (e.g., the people in your workplace or community). Once you have had a

chance to practice offering compassion towards others, move on to the Compassion Towards the Self (5 minute) meditation.

Throughout the week, try to be mindful of the characteristics that you share with others: others are human-beings who, like you, have feelings and face challenges; you, like others, deserve to be treated with kindness and respect.

The meditations below can be played directly through OWL or you can download the audio files for offline use.

Appendix K. The Mindful Grad Student (Chapter 3): Demographic survey.

Gender

Male

Female

I identify as (please specify) _____

Please indicate your current status as a student

Full Time

Part Time

Other

Please indicate your current program of study

Master's Program

Doctoral Program

Professional Degree Program

Postdoctoral Scholar Program

Other (please specify) _____

Appendix L. The Mindful Grad Student (Chapter 3): Ethics approval.

Western Research

Date: 27 February 2018

To: Dr. John Paul Minda

Project ID: 110466

Study Title: Mindfulness Meditation in Student and Professional Groups

Application Type: NMREB Initial Application

Review Type: Delegated

Full Board Reporting Date: April 6 2018

Date Approval Issued: 27/Feb/2018

REB Approval Expiry Date: 27/Feb/2019

Dear Dr. John Paul Minda

The Western University Non-Medical Research Ethics Board (NMREB) has reviewed and approved the WREM application form for the above mentioned study, as of the date noted above. NMREB approval for this study remains valid until the expiry date noted above, conditional to timely submission and acceptance of NMREB Continuing Ethics Review.

This research study is to be conducted by the investigator noted above. All other required institutional approvals must also be obtained prior to the conduct of the study.

Documents Approved:

Document Name	Document Type	Document Date	Document Version
Debriefing Form Mindfulness Meditation in Student and Professional Groups (3)	Debriefing document	09/Dec/2017	2
LOI_Consent	Implied Consent/Assent	13/Feb/2018	
LOI_Consent_TRACKED	Implied Consent/Assent	13/Feb/2018	
Microsoft Forms	Recruitment Materials	03/Nov/2017	1
Microsoft Forms	Recruitment Materials	07/Nov/2017	1
Mindful_Grad	Online Survey	26/Jan/2018	2
Recruitment Poster (1) (1)	Recruitment Materials	13/Dec/2017	2

Documents Acknowledged:

Document Name	Document Type	Document Date	Document Version
Table 1	Supplementary Tables/Figures	13/Dec/2017	2

No deviations from, or changes to the protocol should be initiated without prior written approval from the NMREB, except when necessary to eliminate immediate hazard(s) to study participants or when the change(s) involves only administrative or logistical aspects of the trial.

The Western University NMREB operates in compliance with the Tri-Council Policy Statement Ethical Conduct for Research Involving Humans (TCPS2), the Ontario Personal Health Information Protection Act (PHIPA, 2004), and the applicable laws and regulations of Ontario. Members of the NMREB who are named as Investigators in research studies do not participate in discussions related to, nor vote on such studies when they are presented to the REB. The NMREB is registered with the U.S. Department of Health & Human Services under the IRB registration number IRB 00000941.

Appendix M. The Mindful Grad Student (Chapter 3): Comparisons across all three time points.

In line with an analysis plan registered on OSF, 2 x 3 mixed ANOVAs were conducted for each measure with condition as a between-group factor and time as a within-group factor. Heteroscedasticity and violations of sphericity were addressed via white and epsilon corrections, respectively, and significant interactions were assessed via Holm-Bonferroni-corrected tests of simple main effects on time across condition (i.e., T1, T2, and T3 scores were compared for each condition separately using corrected one-way ANOVAs). Significant simple main effects were followed by Holm post-hoc tests.

Participant Attrition

As discussed in Section 3.3.2.1, the T1 to T2 attrition rate was 39.86%. Of the 83 participants ($n_{\text{Experimental}} = 34$) who responded to both the T1 and T2 surveys, 39 ($n_{\text{Experimental}} = 19$) provided responses to the T3 survey, resulting in a T2 to T3 attrition rate of 53.01%. A likelihood ratio chi-square test indicated that attrition was significantly related to program of study, though Holm-Bonferroni-corrected post-hoc comparisons did not indicate any significant pairwise differences between any of the programs; overall, $\chi^2_{\text{lr}}(3, N = 141) = 8.84$, $p = .03$, $V = .24$; doctoral vs. master's, $p_{\text{adj}} = .08$; master's vs. other, $p_{\text{adj}} = .49$; and all other comparisons, $p_{\text{adj}} = 1.00$. Responding was not found to be affected by gender, enrollment status, condition, or length of previous meditation experience; $\chi^2(1, N = 141) = .01$, $p = .93$, $V = .01$; $\chi^2_{\text{lr}}(2, N = 141) = 2.69$, $p = .26$, $V = .12$; $\chi^2(1, N = 141) = .76$, $p = .38$, $V = .07$; and $z = -1.62$, $p = .11$, $r = -.14$, respectively.

Modified Intention-to-Treat Analyses

For the mITT analyses, $n = 39$ ($n_{\text{Experimental}} = 19$); characteristics of these 39 participants are presented in Table M.1. None of the characteristics differed

Table M.1. The Mindful Grad Student — Comparisons Across All Three Time Points: Participant characteristics.

	Control			Experimental			Overall		
Characteristic	n	M	SD	n	M	SD	n	M	SD
Previous Meditation Experience (Years)[a]	19	2.20	4.88	17	.88	1.74	36	1.58	3.75
Meditation During the Program (Mins/Week)	20	47.63	44.49	19	44.42	33.43	39	46.06	39.01
Continued Meditation After Program Completion									
Yes (Mins/Week)		N/A		11	56.09	93.92			
No				8					
Gender									
Male	3			4			7		
Female	17			15			32		
Enrollment Status									
Full-Time	19			17			36		
Part-Time	1			2			3		
Program of Study									
Master's	13			15			28		
Doctoral	6			4			10		
Postdoctoral Fellowship	1			0			1		

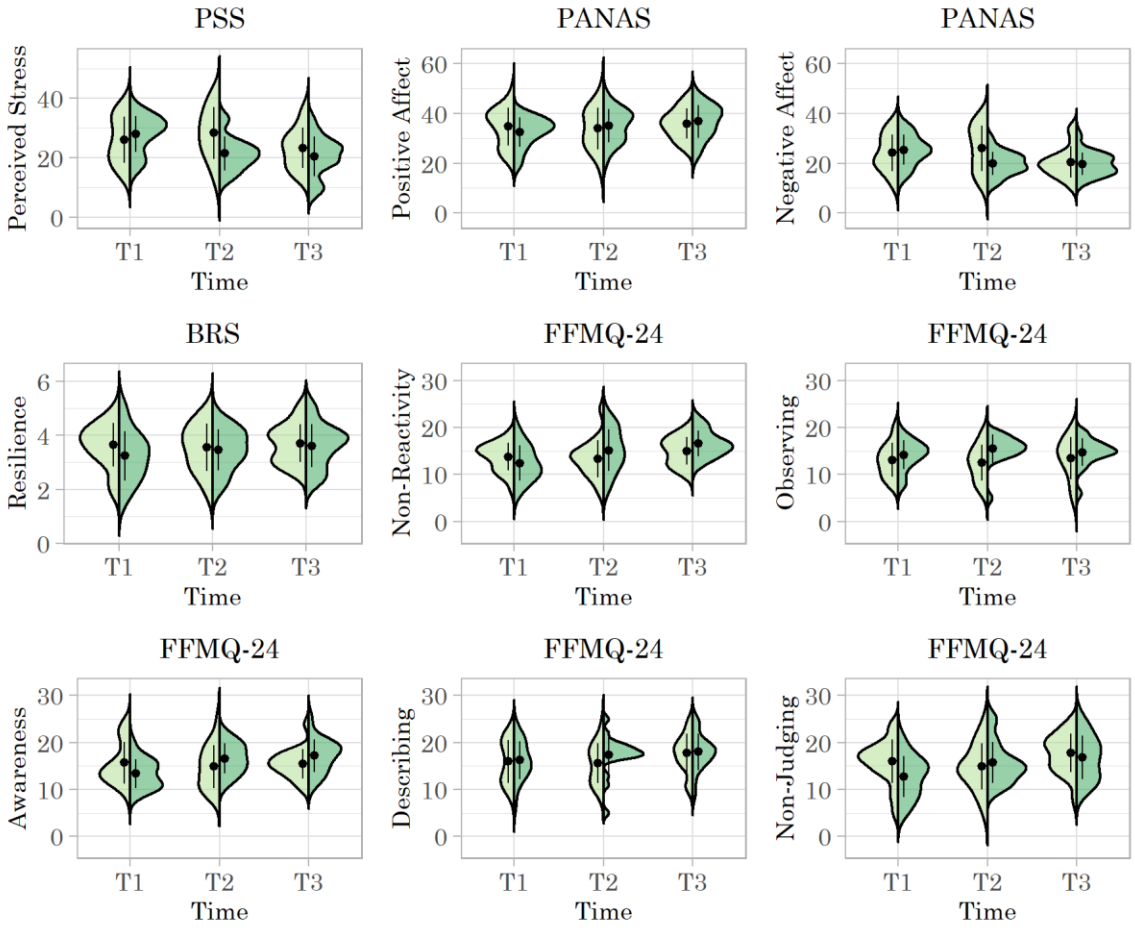
[a]Three participants ($n_{Experimental}$ = 2) indicated that they had 3+ years of meditation experience but failed to provide further details regarding the number of years of experience that they possessed; these individuals have been excluded from *M* and *SD* calculations for this variable.

significantly across conditions among these participants; gender, $\chi^2_{lr}(1, N = 39) = .24$, $p = .62$, $V = .08$; enrollment status, $\chi^2_{lr}(1, N = 39) = .43$, $p = .51$, $V = .10$; program, $\chi^2_{lr}(2, N = 39) = 1.91$, $p = .39$, $V = .20$; years of previous meditation experience, $z = .69$, $p = .50$, $r = .12$; and minutes per week spent meditating during the program, $z = .17$, $p = .87$, $r = .03$. Score distributions for each outcome measure are presented in Figure M.1. Scales generally displayed adequate levels of internal consistency (i.e., $\alpha \geq .70$; see Table M.2), though Cronbach's alpha was found to be low for the experimental condition at T3 on the negative affect subscale of the PANAS and at both T1 and T3 on the anxiety subscale of the DASS-21. Cronbach's alpha was also found to be low for the waitlist control condition at both T1 and T3 on the non-reactivity subscale of the FFMQ-24 and for both conditions at T3 on the stress subscale of the DASS-21.

Perceived Stress Scale

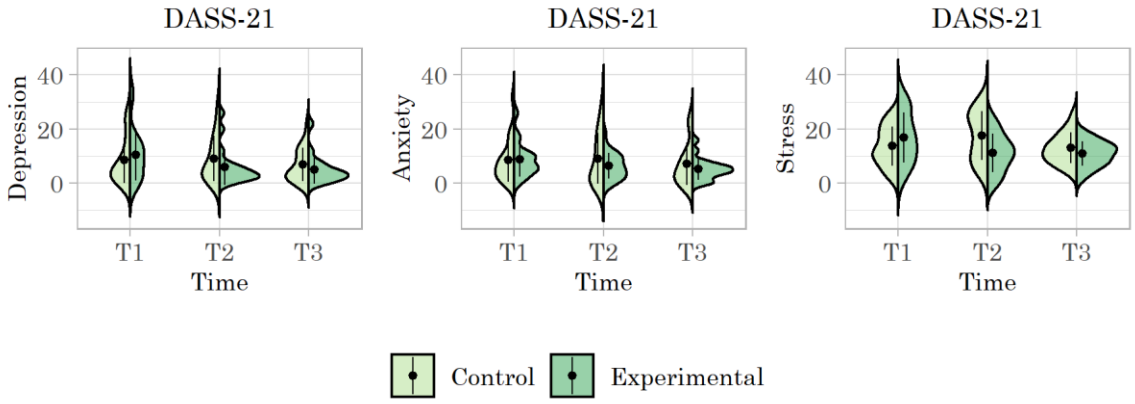
The interaction was found to be statistically significant; $F(2, 74) = 12.62$, $p < .001$, $\eta^2_G = .07$. Tests of simple main effects found a significant main effect of time for both the experimental and control conditions; $F(2, 36) = 18.06$, $p_{adj} < .001$, $\eta^2_G = .24$ and $F(2, 38) = 9.96$, $p_{adj} < .001$, $\eta^2_G = .07$, respectively. Post-hocs further revealed that, for participants in the experimental condition, both T2 ($M = 21.37$, $SD = 5.65$) and T3 ($M = 20.37$, $SD = 6.71$) scores on the PSS were significantly lower than T1 scores ($M = 28.00$, $SD = 6.07$); $p_{adj} < .001$ for both. A significant experimental score difference was not observed between T2 and T3; $p_{adj} = .51$. For participants in the control condition, T2 PSS scores ($M = 28.30$, $SD = 8.70$) were found to be significantly higher than T1 scores ($M = 26.05$, $SD = 7.82$); $p_{adj} = .05$. Control T3 scores ($M = 23.30$, $SD = 6.84$) were also found to be significantly lower than both T1 and T2 scores; $p_{adj} = .05$ and $p_{adj} = .003$, respectively.

Figure M.1. The Mindful Grad Student — Modified Intention-to-Treat Comparisons Across All Three Time Points: Distributions of scores on each of the outcome measures.



(Continued on the next page.)

(Figure M.1. continued.)



Note. Score distributions are shown for the Perceived Stress Scale (PSS); the positive and negative affect subscales of the Positive and Negative Affect Schedule (PANAS); the Brief Resilience Scale (BRS); the non-reactivity, observing, awareness, describing, and non-judging subscales of the Five Facet Mindfulness Questionnaire-24 (FFMQ-24); and the depression, anxiety, and stress subscales of the Depression Anxiety Stress Scales-21 (DASS-21). Scores are depicted at Time 1 (T1), Time 2 (T2), and Time 3 (T3) for both the control (light green/grey) and experimental (dark green/grey) conditions. Dots and whiskers represent means and standard deviations, respectively.

Table M.2. The Mindful Grad Student — Comparisons Across All Three Time Points: Internal consistency (α) of the scales used.

	Control Condition				Experimental Condition				Conditions Combined			
Measure	T1	T2	T3	Overall	T1	T2	T3	Overall	T1	T2	T3	Overall
Perceived Stress Scale												
	.89	.88	.82	.88	.81	.82	.88	.86	.86	.89	.86	.88
Positive and Negative Affect Schedule												
Positive Affect	.90	.94	.85	.91	.86	.91	.93	.90	.88	.92	.89	.90
Negative Affect	.80	.90	.85	.87	.75	.78	.69	.79	.78	.89	.80	.84
Brief Resilience Scale												
	.92	.94	.91	.92	.91	.91	.93	.92	.92	.92	.92	.92
Five Facet Mindfulness Questionnaire-24												
Non-Reactivity	.64	.83	.65	.74	.87	.91	.78	.89	.77	.88	.72	.82
Observing	.74	.88	.88	.84	.76	.83	.84	.80	.73	.88	.87	.83
Awareness	.89	.90	.81	.88	.83	.83	.89	.87	.88	.88	.86	.87
Describing	.87	.88	.93	.89	.88	.91	.88	.89	.87	.89	.90	.89
Non-Judging	.81	.88	.86	.86	.83	.90	.92	.90	.84	.88	.89	.88
Depression Anxiety Stress Scales-21												
Depression	.89	.90	.86	.89	.93	.91	.92	.92	.91	.90	.87	.90
Anxiety	.82	.87	.87	.85	.69	.72	.66	.71	.77	.84	.83	.81
Stress	.77	.85	.68	.80	.83	.79	.56	.81	.81	.85	.64	.81

Note. T1 = Time 1, T2 = Time 2, and T3 = Time 3.

Positive and Negative Affect Schedule

Positive Affect. Neither the interaction nor the main effect of condition were found to be statistically significant; $F(2, 74) = 2.36$, $p = .10$, $\eta^2_G = .01$ and $F(1, 37) = .002$, $p = .97$, $\eta^2_G < .001$, respectively. The main effect of time, however, was significant; $F(2, 74) = 5.14$, $p = .01$, $\eta^2_G = .03$. Post-hocs further revealed that T3 scores ($M = 36.36$, $SD = 6.19$) on the positive affect subscale of the PANAS were significantly higher than T1 scores ($M = 33.67$, $SD = 6.79$); $p_{adj} = .01$. Significant score differences were not observed between T1 and T2 ($M = 34.51$, $SD = 7.54$) or T2 and T3; $p_{adj} = .35$ and $p_{adj} = .09$, respectively.

Negative Affect. Scores on the negative affect subscale of the PANAS displayed violations of the assumption of homoscedasticity. A white correction was, therefore, applied to the test of condition. The interaction was found to be statistically significant; $F(2, 74) = 7.64$, $p = .001$, $\eta^2_G = .06$. Tests of simple main effects — which employed an epsilon correction for the control condition ($\varepsilon_{HF} = .83$) — found a significant main effect of time for both the experimental and control conditions; $F(2, 36) = 9.40$, $p_{adj} = .001$, $\eta^2_G = .22$ and $F(1.66, 31.63) = 9.81$, $p_{adj} = .001$, $\eta^2_G = .09$, respectively. Post-hocs further revealed that, for participants in the experimental condition, both T2 ($M = 19.89$, $SD = 4.67$) and T3 ($M = 19.74$, $SD = 4.48$) negative affect scores were significantly lower than T1 scores ($M = 25.37$, $SD = 6.07$); $p_{adj} = .01$ and $p_{adj} = .005$, respectively. A significant experimental score difference was not observed between T2 and T3; $p_{adj} = .91$. For participants in the control condition, T3 negative affect scores ($M = 20.50$, $SD = 6.35$) were found to be significantly lower than both T1 ($M = 24.15$, $SD = 7.39$) and T2 ($M = 26.00$, $SD = 9.07$) scores; $p_{adj} = .02$ and $p_{adj} = .01$, respectively. A significant control score difference was not observed between T1 and T2; $p_{adj} = .06$.

Brief Resilience Scale

Neither the interaction nor the main effect of condition was found to be statistically significant; $F(2, 74) = 2.36$, $p = .10$, $\eta^2_G = .01$ and $F(1, 37) = .65$, $p = .43$, $\eta^2_G = .01$, respectively. The main effect of time, however, was significant, though post-hocs revealed no significant pairwise score differences between T1 ($M = 3.44$, $SD = .87$), T2 ($M = 3.51$, $SD = .81$), or T3 ($M = 3.66$, $SD = .74$); overall, $F(2, 74) = 3.57$, $p = .03$, $\eta^2_G = .01$; for T1 vs. T2, $p_{adj} = .48$; and for the other two comparisons, $p_{adj} = .08$.

Five Facet Mindfulness Questionnaire-24

Non-Reactivity. The interaction was found to be statistically significant; $F(2, 74) = 6.46$, $p = .003$, $\eta^2_G = .04$. Tests of simple main effects found a significant main effect of time for both the experimental and control conditions; $F(2, 36) = 13.50$, $p_{adj} < .001$, $\eta^2_G = .19$ and $F(2, 38) = 4.38$, $p_{adj} = .02$, $\eta^2_G = .04$, respectively. Post-hocs further revealed that, for participants in the experimental condition, both T2 ($M = 15.16$, $SD = 4.46$) and T3 ($M = 16.58$, $SD = 2.73$) scores on the non-reactivity subscale of the FFMQ-24 were significantly higher than T1 scores ($M = 12.42$, $SD = 3.70$); $p_{adj} = .01$ and $p_{adj} < .001$, respectively. A significant experimental score difference was not observed between T2 and T3; $p_{adj} = .11$. For participants in the control condition, no significant pairwise differences were observed between T1 ($M = 13.80$, $SD = 2.98$), T2 ($M = 13.35$, $SD = 3.94$), or T3 ($M = 15.00$, $SD = 2.96$) scores; T1 vs. T2, $p_{adj} = .38$; both T2 vs. T3 and T1 vs. T3, $p_{adj} = .07$.

Observing. Scores on the observing subscale of the FFMQ-24 displayed a violation of the assumption of sphericity. An epsilon correction ($\varepsilon_{HF} = .84$) was, therefore, applied to the interaction and to the test of time. None of the effects were found to be statistically significant; interaction, $F(1.69, 62.39) =$

2.59, $p = .09$, $\eta^2_G = .02$; main effect of condition, $F(1, 37) = 3.06$, $p = .09$, $\eta^2_G = .06$; and main effect of time; $F(1.69, 62.39) = .57$, $p = .54$, $\eta^2_G = .003$.

Acting with Awareness. The interaction was found to be statistically significant; $F(2, 74) = 7.72$, $p < .001$, $\eta^2_G = .07$. Tests of simple main effects found a significant main effect of time for the experimental condition but not for the control condition; $F(2, 36) = 11.34$, $p_{adj} < .001$, $\eta^2_G = .22$ and $F(2, 38) = .56$, $p_{adj} = .58$, $\eta^2_G = .01$, respectively. Post-hocs further revealed that, for participants in the experimental condition, both T2 ($M = 16.58$, $SD = 3.19$) and T3 ($M = 17.21$, $SD = 3.47$) scores on the awareness subscale of the FFMQ-24 were significantly higher than T1 scores ($M = 13.37$, $SD = 3.04$); $p_{adj} = .01$ and $p_{adj} = .001$, respectively. A significant experimental score difference was not observed between T2 and T3; $p_{adj} = .42$.

Describing. Neither the interaction nor the main effect of condition was found to be statistically significant; $F(2, 74) = 1.96$, $p = .15$, $\eta^2_G = .01$ and $F(1, 37) = .38$, $p = .54$, $\eta^2_G = .01$, respectively. The main effect of time, however, was significant; $F(2, 74) = 9.16$, $p < .001$, $\eta^2_G = .04$. Post-hocs further revealed that T3 scores ($M = 17.87$, $SD = 3.94$) on the describing subscale of the FFMQ-24 were significantly higher than both T1 ($M = 16.08$, $SD = 4.24$) and T2 ($M = 16.46$, $SD = 4.24$) scores; $p_{adj} < .001$ and $p_{adj} = .004$, respectively. A significant score difference was not observed between T1 and T2; $p_{adj} = .42$.

Non-Judging. The interaction was found to be statistically significant; $F(2, 74) = 7.08$, $p = .002$, $\eta^2_G = .04$. Tests of simple main effects found a significant main effect of time for both the experimental and control conditions; $F(2, 36) = 15.92$, $p_{adj} < .001$, $\eta^2_G = .13$ and $F(2, 38) = 6.22$, $p_{adj} = .005$, $\eta^2_G = .06$, respectively. Post-hocs further revealed that, for participants in the experimental condition, both T2 ($M = 15.74$, $SD = 4.41$) and T3 ($M = 16.79$, $SD = 4.63$) scores on the non-judging subscale of the FFMQ-24 were significantly higher than T1 scores ($M = 12.74$, $SD = 4.42$); $p_{adj} = .002$ and p_{adj}

< .001, respectively. A significant experimental score difference was not observed between T2 and T3; p_{adj} = .11. For participants in the control condition, T3 non-judging scores (M = 17.75, SD = 4.12) were found to be significantly higher than T2 scores (M = 14.90, SD = 4.96); p_{adj} = .02. Significant control score differences were not observed between T1 (M = 16.05, SD = 4.63) and T2 or T2 and T3; p_{adj} = .15 and p_{adj} = .08, respectively.

Depression Anxiety Stress Scales-21

The spread of participants across each of the DASS-21 severity categories is outlined in Table M.3. Between condition comparisons suggest that the experimental condition began the study with more severe levels of depression and stress than the waitlist control condition. However, symptom severity seems to have declined in both conditions post-intervention.

Depression. Scores on the depression subscale of the DASS-21 displayed a violation of the assumption of sphericity. An epsilon correction (ε_{HF} = .83) was, therefore, applied to the interaction and to the test of time. The interaction was found to be statistically significant; F(1.66, 61.27) = 4.15, p = .03, η^2_G = .02. Tests of simple main effects — which employed an epsilon correction for the control condition (ε_{GG} = .68) — found a significant main effect of time for the experimental condition but not the control condition; F(2, 36) = 8.96, p_{adj} = .001, η^2_G = .10 and F(1.35, 25.69) = 1.62, p_{adj} = .22, η^2_G = .02, respectively. Post-hocs further revealed that, for participants in the experimental condition, both T2 (M = 5.89, SD = 6.75) and T3 (M = 4.84, SD = 5.18) scores were significantly lower than T1 scores (M = 10.53, SD = 9.66); p_{adj} = .003 and p_{adj} = .01, respectively. A significant experimental score difference was not observed between T2 and T3; p_{adj} = .42.

Anxiety. Scores on the anxiety subscale of the DASS-21 displayed a violation of the assumption of homoscedasticity. A white correction was, therefore, applied to the test of condition. Neither the interaction nor the main effect of

Table M.3. The Mindful Grad Student — Comparisons Across All Three Time Points: Percentage of participant responses on the Depression Anxiety Stress Scales-21 that fall in each of the symptom severity categories.

	Depression			Anxiety			Stress		
Symptom Severity	Time 1	Time 2	Time 3	Time 1	Time 2	Time 3	Time 1	Time 2	Time 3
Control Condition[a]									
Normal	70.00	60.00	65.00	50.00	50.00	60.00	60.00	45.00	70.00
Mild	5.00	10.00	20.00	15.00	5.00	5.00	15.00	5.00	15.00
Moderate	10.00	20.00	10.00	15.00	15.00	20.00	20.00	25.00	10.00
Severe	15.00	5.00	5.00	10.00	15.00	.00	5.00	25.00	5.00
Extremely Severe	.00	5.00	.00	10.00	15.00	15.00	.00	.00	.00
Experimental Condition[b]									
Normal	47.37	84.21	89.47	52.63	63.16	78.95	47.37	73.68	84.21
Mild	15.79	5.26	5.26	.00	.00	10.53	10.53	10.53	15.79
Moderate	26.32	5.26	.00	31.58	31.58	5.26	15.79	15.79	.00
Severe	.00	5.26	5.26	10.53	5.26	5.26	26.32	.00	.00
Extremely Severe	10.53	.00	.00	5.26	.00	.00	.00	.00	.00

Note. [a]$n = 20$. [b]$n = 19$.

condition were found to be statistically significant; $F(2, 74) = 1.67$, $p = .20$, $\eta^2_G = .01$ and $F(1, 37) = .55$, $p = .46$, $\eta^2_G = .02$. The main effect of time, however was significant; $F(2, 74) = 4.46$, $p = .01$, $\eta^2_G = .02$. Post-hocs further revealed that T3 anxiety scores ($M = 6.15$, $SD = 6.25$) were significantly lower than T1 scores ($M = 8.56$, $SD = 7.11$); $p_{adj} = .01$. Significant score differences were not observed between T1 and T2 ($M = 7.74$, $SD = 7.56$) or T2 and T3; $p_{adj} = .35$ and $p_{adj} = .13$, respectively.

Stress. The interaction was found to be statistically significant; $F(2, 74) = 7.68$, $p < .001$, $\eta^2_G = .07$. Tests of simple main effects found a significant main effect of time for both the experimental and control conditions; $F(2, 36) = 6.84$, $p_{adj} = .01$, $\eta^2_G = .13$ and $F(2, 38) = 4.60$, $p_{adj} = .02$, $\eta^2_G = .07$, respectively. Post-hocs further revealed that, for participants in the experimental condition, both T2 ($M = 11.16$, $SD = 7.07$) and T3 ($M = 10.84$, $SD = 4.54$) scores on the stress subscale of the DASS-21 were significantly lower than T1 scores ($M = 16.74$, $SD = 9.27$); $p_{adj} = .02$ for both. A significant experimental score difference was not observed between T2 and T3; $p_{adj} = .82$. For participants in the control condition, T2 stress scores ($M = 17.60$, $SD = 9.03$) were found to be significantly higher than T1 scores ($M = 13.70$, $SD = 7.23$); $p_{adj} = .03$. Control T3 scores ($M = 13.00$, $SD = 5.75$), which did not differ from T1 scores, were also found to be significantly lower than T2 scores; $p_{adj} = .69$ and $p_{adj} = .04$, respectively.

Per-Protocol Analyses

Of the 39 participants who responded to all three assessments, three in the waitlist control condition indicated that they did not meditate at all throughout the program. Furthermore, one participant in the waitlist control condition indicated that they were actively participating in another MBI during the study. For PP analyses, therefore, $n = 35$ ($n_{Experimental} = 18$). PP

analyses deviated from mITT analyses with respect to the PSS, the BRS, and the depression and stress subscales of the DASS-21 (see Figure M.2). All other results from PP analyses were found to be comparable to the results from mITT analyses.

Perceived Stress Scale

As in mITT analyses, PP analyses found that, for participants in the control condition, T3 scores (M = 24.47, SD = 6.72) on the PSS were significantly lower than T1 scores (M = 27.29, SD = 7.55); p_{adj} = .002. Unlike mITT analyses, however, PP analyses revealed no significant differences between T1 control scores and either T2 (M = 29.47, SD = 8.15) or T3 control scores; p_{adj} = .08 for both. Results from experimental post-hocs were comparable between PP and mITT analyses.

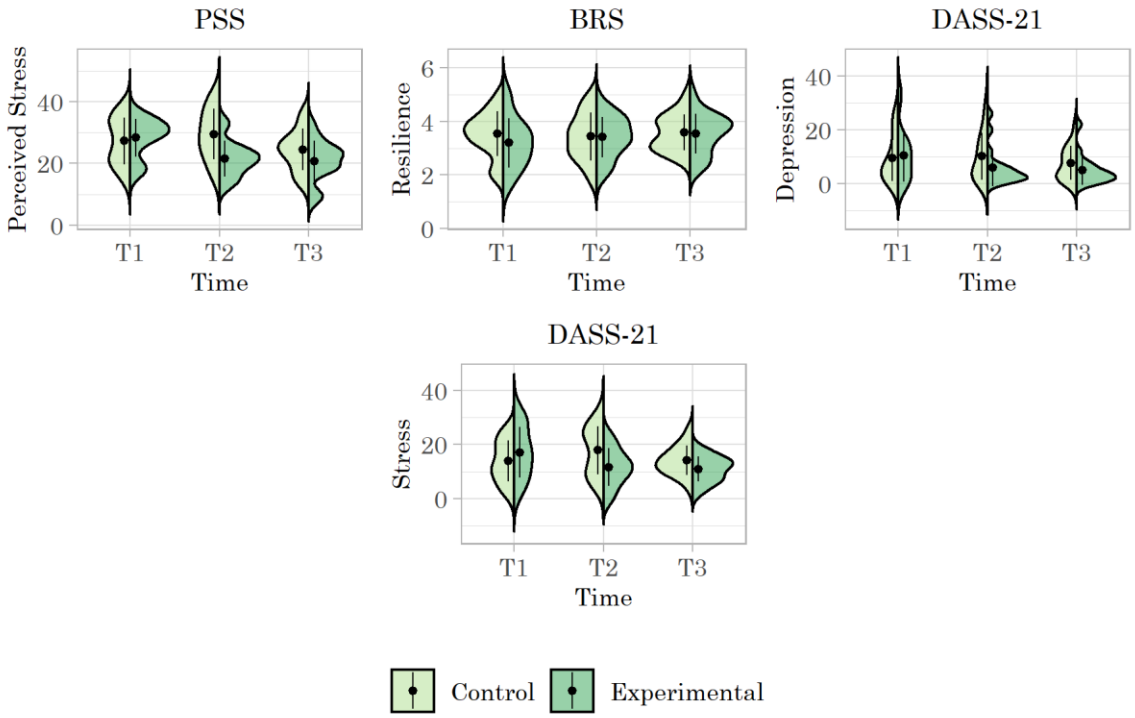
Brief Resilience Scale

mITT analyses revealed a significant main effect of time, though post-hoc tests found no significant pairwise score differences across any of the three time points. In PP analyses, however, the main effect of time was not significant; $F(2, 66) = 2.60$, p = .08, η^2_G = .01. PP results regarding the interaction and the main effect of condition were comparable to mITT results.

Depression Anxiety Stress Scales-21

Depression. As in mITT analyses, PP analyses employed an epsilon correction (ε_{HF} = .83). Whereas the interaction was found to be significant in mITT analyses, it was not significant in PP analyses; $F(1.66, 54.82) = 4.15$, p = .03, η^2_G = .02. The main effect of time, however, was found to be significant; $F(1.66, 54.82) = 6.31$, p = .01, η^2_G = .04. Post-hocs further revealed that both T2 (M = 8.00, SD = 8.01) and T3 (M = 6.23, SD = 5.88) scores on the depression subscale of the DASS-21 were significantly lower than T1 scores

Figure M.2. The Mindful Grad Student — Per-Protocol Comparisons Across All Three Time Points: Distributions of scores on the Perceived Stress Scale (PSS), the Brief Resilience Scale (BRS), and the depression and stress subscales of the Depression Anxiety Stress Scales-21 (DASS-21).



Note. Scores are depicted at Time 1 (T1), Time 2 (T2), and Time 3 (T3) for both the control (light green/grey) and experimental (dark green/grey) conditions. Dots and whiskers represent means and standard deviations, respectively.

(M = 10.06, SD = 9.22); p_{adj} = .05 and p_{adj} = .02, respectively. A significant score difference was not observed between T2 and T3; p_{adj} = .13.

Stress. As in mITT analyses, PP analyses found that, for participants in the control condition, T3 scores (M = 14.12 SD = 5.50) on the stress subscale of the DASS-21 were not significantly different from T1 scores (M = 13.88, SD = 7.66); p_{adj} = .90. Unlike mITT analyses, however, PP analyses also revealed no significant differences between T1 control scores and T2 control scores (M = 17.88, SD = 8.85) or between T2 control scores and T3 control scores; p_{adj} = .06 and p_{adj} = .10, respectively. Results from experimental post-hocs were comparable between PP and mITT analyses.

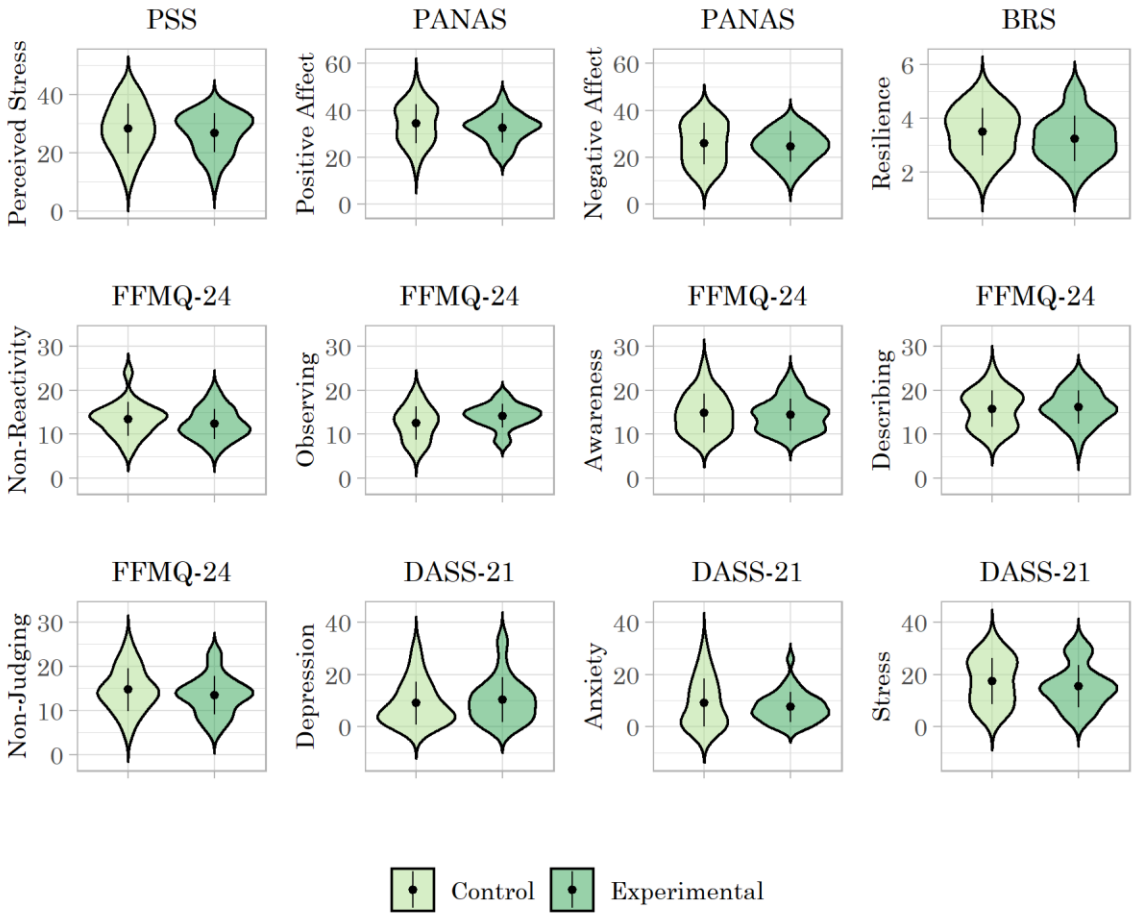
Appendix N. The Mindful Grad Student (Chapter 3): Supplementary analyses.

In Chapter 3, experimental participants seem to have displayed different program-related changes than participants in the waitlist control condition in both mITT and PP analyses. The following analyses explore some of the potential explanations for this discrepancy, including between-group differences in participant characteristics and variations in pre-intervention baselines. Participant characteristics were compared across conditions using Pearson or likelihood ratio chi-square tests and independent *t*-tests or Wilcoxon-Mann-Whitney tests. Independent *t*-tests/Wilcoxon-Mann Whitney tests were also used to perform between-group comparisons on pre-intervention scores (i.e., experimental T1 scores vs. control T2 scores). For independent *t*-tests, heteroscedasticity was addressed via Welch adjustments.

Modified Intention-to-Treat

mITT comparisons included the 34 experimental participants from the T2 comparison analyses in Section 3.3.2.2 and the 21 waitlist control participants from the T2 and T3 comparison analyses in Section 3.3.3.2. Therefore, $n = 55$; characteristics of the experimental and waitlist control participants are presented in tables 3.1 and 3.4, respectively. None of the characteristics differed significantly across conditions among these participants; gender, $\chi^2_{lr}(1, N = 55) = .002$, $p = .97$, $V = .01$; enrollment status, $\chi^2_{lr}(2, N = 55) = 1.34$, $p = .51$, $V = .13$; program of study, $\chi^2_{lr}(3, N = 55) = 1.19$, $p = .76$, $V = .12$; years of previous meditation experience, $z = .1.19$, $p = .24$, $r = .17$; and minutes per week spent meditating during the program, $z = .36$, $p = .73$, $r = .05$. Pre-intervention score distributions for each outcome measure are presented in Figure N.1.

Figure N.1. The Mindful Grad Student — Modified Intention-to-Treat Supplementary Analyses: Distributions of pre-intervention scores on each of the outcome measures.



Note. Score distributions are shown for the Perceived Stress Scale (PSS); the positive and negative affect subscales of the Positive and Negative Affect Schedule (PANAS); the Brief Resilience Scale (BRS); the non-reactivity, observing, awareness, describing, and non-judging subscales of the Five Facet Mindfulness Questionnaire-24 (FFMQ-24); and the depression, anxiety, and stress subscales of the Depression Anxiety Stress Scales-21 (DASS-21). For participants in the control condition (light green/grey), pre-intervention refers to Time 2. For participants in the experimental condition (dark green/grey), pre-intervention refers to Time 1. Dots and whiskers represent means and standard deviations, respectively.

Pre-Intervention Comparisons

Perceived Stress Scale. Pre-intervention scores on the PSS did not differ between conditions; $t(53) = .71$, $p = .48$, $d = .20$.

Positive and Negative Affect Schedule. Pre-intervention scores on the positive and negative affect subscales of the PANAS did not differ between conditions; $t(53) = .93$, $p = .36$, $d = .26$ and $t(33.37) = .57$, $p = .57$, $d = .16$, respectively.

Brief Resilience Scale. Pre-intervention scores on the BRS did not differ between conditions; $t(53) = 1.12$, $p = .27$, $d = .31$.

Five Facet Mindfulness Questionnaire-24. Pre-intervention scores on the non-reactivity, observing, awareness, describing, and non-judging subscales of the FFMQ-24 did not differ between conditions; $t(53) = 1.05$, $p = .30$, $d = .29$; $t(53) = -1.81$, $p = .08$, $d = -.50$; $z = .10$, $p = .92$, $r = .01$; $t(53) = -.35$, $p = .73$, $d = -.10$; and $t(53) = .98$, $p = .33$, $d = .27$, respectively.

Depression Anxiety Stress Scales-21. Pre-intervention scores on the depression, anxiety, and stress subscales of the DASS-21 did not differ between conditions; $z = -.66$, $p = .51$, $r = .09$; $z = .15$, $p = .89$, $r = .02$; and $t(53) = .88$, $p = .38$, $d = .25$, respectively.

Per-Protocol Analyses

PP comparisons included the 33 experimental participants from the T2 comparison analyses in Section 3.3.2.3 and the 18 waitlist control participants from the T2 and T3 comparison analyses in Section 3.3.3.3. Therefore, $n = 51$. All results from PP analyses were found to be comparable to the results from mITT analyses.

Curriculum Vitae

Name	Emily Grace Nielsen
Education	*Ph.D. Psychology* (Expected) The University of Western Ontario; London, ON; 2020 *M.Sc. Psychology* The University of Western Ontario; London, ON; 2015 *B.Sc. Honours Psychology: Research Specialist; Minor: Biology* Wilfrid Laurier University; Waterloo, ON; 2013
Honours and Awards	*Natural Sciences and Engineering Research Council* Postgraduate Scholarship – Doctoral; 2017-2019 *Ontario Graduate Scholarship* 2014-2015 *Social Science and Humanities Research Council* Canada Graduate Scholarship – Master's; 2013-2014
Related Work Experience	*Research Assistant* The University of Western Ontario; 2019-2020 *Undergraduate Course Instructor* The University of Western Ontario; 2016-2018
Related Presentations	Martyn, L. H., Nielsen, E. G., & Minda, J. P. (June 2019). Using mindfulness meditation to improve the well-being of graduate students. *Poster presented at the 29th Annual Meeting of the Canadian Society for Brain, Behaviour, and Cognitive Science (CSBBCS)*, Waterloo, ON, CAN. Nielsen, E. G., Cho, J., Wallis, L. E., Martyn, L., & Minda, J. P. (May 2019). Wellness in the workplace: A 30-day mindfulness program reduced stress and improved mood in lawyers. *Poster presented at the 31st Annual Convention of the Association for Psychological Science (APS),* Washington, DC, USA.