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The Development and Validation of a Preliminary Meditation Intentions Questionnaire

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Abstract

Meditation programs and mindfulness interventions have become increasingly popular over the last 30 years in both clinical and non-clinical populations. However, challenges such as motivating participants in 8-week programs and adherence rates are issues in many mindfulness meditation interventions. The Meditation Intentions Questionnaire (MIQ) was developed as a measure intended to guide participants to set their own goals and intentions for meditation. The MIQ has six subscales with 8 items each. The subscales assess intentions for participating in meditation programs in the following domains: cognitive enhancement, increased emotional control, greater positive affect, stress relief, spiritual discovery and psychological discovery. Items in the MIQ were selected according to previous research undertaken by Pepping et al. (2016), Shapiro (1992) and the author's previous experience with meditation facilitation. The MIQ was then administered to a sample of 145 graduate students from various Canadian faculties and universities. Both a confirmatory factor analysis and an exploratory structural equation modeling analysis confirmed the hypothesized factor structure of the questionnaire. As a result, a short form of the questionnaire, the MIQ-24, consisting of 4 items per scale was developed, and it was also found to have a strong model fit. We found the MIQ-24 to correlate with theoretically linked constructs in mental health. Overall, as a preliminary measure of meditation intentions, the MIQ-24 has promising psychometric characteristics. Further studies with diverse and larger participant pools are needed to demonstrate the MIQ-24's efficacy as a general tool to help participants through the process of setting intentions and goals in meditation programs.

Keywords

Mindfulness, Meditation, Intentions, Mindfulness Meditation, Scale Development, Confirmatory Factor Analysis

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Chapter 1: Introduction

Records of meditation from the Hindu traditions of Vedantism date back as early as 1500 BCE. Various traditions such as Buddhism in India or Chinese Taoism embed meditation into their practices. As each of these religious practices spread throughout the world, so did meditation, appearing in Judaism, Christianity, Islam and many other religious and esoteric practices.

These religions became core parts of Western culture, resulting in the proliferation of meditation practice. Skipping to the modern era, it has been only a few decades since Psychology and related health disciplines have begun investigating the positive impacts of meditation and underscored the value of mindfulness, self-awareness, compassion and kindness cultivated through meditation practice.

In 2017, the Center for Disease Control and Prevention stated that 9.9% of all US workers are exploring meditation for a variety of reasons (Kachan et al. 2017). The rise in popularity of meditation in the West over the last 30 years has led some psychologists to include mindfulness meditation as part of their clinical practices.

1.1 An overview of Mindfulness and Mindfulness Meditation

Mindfulness meditation is the practice of meditation centered around the development of mindfulness. Kabat-Zinn (1998) conducted one of the first empirical studies of mindfulness meditation in a clinical setting. He defined mindfulness as focusing one's attention on an experience as it unfolds, moment by moment, with non-judgmental, open-minded curiosity and acceptance. Chiesa (2013) explored how the definitional inconsistency of mindfulness across decades of literature has weakened the scientific reliability of such studies. It is useful to review the various definitions and previously developed measures of individual differences in

mindfulness or measures of changes that occur as a result of practicing mindfulness meditation in Mindfulness-Based Interventions (MBIs).

To explore the impacts of mindfulness meditation, one must first separate the component of mindfulness from the practice of MBIs. Mindfulness as a single trait construct was explored as part of the development of the Mindful Attention Awareness Scale (MAAS; Brown & Ryan, 2003). This 15-item questionnaire differentiated by their ability and ease to reach mindfully aware states persons engaged in the practice mindfulness meditation from others (for instance, Zen meditators compared to age and sex-matched controls). Moreover, Brown and Ryan (2003) tested the relationship between mindfulness and well-being within an intervention paradigm in which changes in MAAS were used to predict changes in mood and stress among a sample of cancer patients. Although the questionnaire was validated in a number of studies, it was never compared to an active control group, therefore failing to show whether change in MAAS scores was related to increases in mindfulness attributable to mindfulness practice, or to other nonspecific factors such as expectation effects, group support, or even simple exposure to mindfulness terminology.

Many researchers believe that a single faceted concept of mindfulness is incomplete as it does not consider the complexities inherent in the original definition as put forward by Kabat-Zinn (1998). For example, Baer et al. (2006) explored a multifaceted instrument for measuring mindfulness through the validation of the Kentucky Inventory of Mindfulness Skills (KIMS; Baer, Smith, & Allen, 2004), a 39-item instrument designed to measure four elements of mindfulness: observing, describing, acting with awareness, and accepting without judgment. Items include, “I notice when my moods begin to change” (observe); “I’m good at

finding words to describe my feelings" (describe); "When I do things, my mind wanders off and I'm easily distracted" (act with awareness); and "I tell myself that I shouldn't be feeling the way I'm feeling" (accept without judgment). Items are rated on a 5-point Likert-type scale ("never or very rarely true" to "always or almost always true"). The KIMS is based largely on the Dialectical Behaviour Therapy (DBT) conceptualization of mindfulness skills. DBT is a psychosocial intervention developed for Bi-polar Disorder and consists of several types of interventions, including mindfulness training (Linehan, 1993a, 1993b).

The KIMS measures the overall tendency to be mindful in daily life. Exploratory and confirmatory factor analyses supported the proposed four-factor structure. Baer et al. (2006) took the model of the KIMS further by developing a five-factor model of mindfulness characterized by nonreactivity, observing, acting with awareness, describing, and nonjudging. A hierarchical confirmatory factor analysis of their proposed model suggested that four of the identified factors were components of an overall mindfulness construct. The fifth was nonreactivity, which appears to describe a non-reactive stance toward internal experience.

To summarize, there are many definitions of mindfulness currently found in literature, and it is clear that they overlap significantly. Mindfulness traditionally refers to an awareness of the present moment that can be cultivated through meditation practice. Meditation can foster non-judgmental, open-minded curious exploration of your thought's, feelings and present moment experiences. It is suggested that without gaining a greater awareness of the present-moment, one cannot increase in behaviors involving nonreactivity, observing, acting with awareness, describing, and nonjudging.

Although there are many forms of meditation found in cultures and religions all over the world, this thesis investigates the reasons (i.e., intentions) people have for wanting to try or develop a mindfulness meditation practice. This particular form of meditation focuses on the cultivation of mindfulness and, in some cases, the cultivation of compassion as used in a series of exercises such as those found in Mindfulness-Based Stress Reduction (MBSR) or similar Mindfulness Based Interventions (MBIs). Within MBIs, participants often participate in exercises such as focusing on the breath through guided instructions in person or online. These guided meditations are aimed at cultivating a focused attention and an awareness of the body and attention drifts so that a person may notice where their mind has gone and gently, nonjudgmentally bring the attention back to the breath. In contrast to mindfulness meditation, loving and kindness meditation seeks to cultivate compassion and kindness to oneself and others through guided instructions such as:

> "Keeping your eyes closed, think of a person close to you who loves you very much. It could be someone from the past or the present; someone still in life or who has passed. Imagine that person standing on your right side, sending you their love. That person is sending you wishes for your safety, for your well-being and happiness."

A large amount of research has demonstrated that mindfulness taught through meditation is an effective adjunct treatment for improving pain management, decreasing symptoms of depression, anxiety and PTSD (Jimenez, 2008; Hofman, Sawyer, Witt & Oh, 2010; Hoge et al., 2013; Hoge et al., 2017). Furthermore, many of the exercises that draw attention toward moment to moment awareness increase heart rate variability, a correlate of good health and longevity, decrease stress responses, and increase cognitive and emotional control (Mrazek, Franklin,

Phillips, Baird, & Schooler, 2013). Over the last decade, a consensus in adult psychology on the benefits of mindfulness meditation has led to a desire to apply mindfulness meditation concepts and techniques to the development of programs for people coping with a variety of difficulties. In non-clinical samples, MBI programs have been developed for groups of lawyers (Halpern, 2012) and nurses (van der Riet, Levitt-Jones & Aquino-Russell, 2018). In those cases, MBIs have been explored as a method of cognitive enhancement and have been found to improve aspects of attention, memory, and executive function. Cognitive function underlies most aspects of our lives, such as the ability to remain focused, an effective working memory, as well as our ability to reason and problem solve.

The study of meditation outcomes has garnered much interest with research ranging from brain imaging, physiological correlates, self-report and cognitive measures. Chiesa et al. (2011) carried out a systematic review of the effects of mindfulness meditation on cognition. Their review described preliminary evidence that early phases of mindfulness meditation practice, such as within 8-week programs or multi-day meditation retreats, have positive effects on cognitive functions such as conflict monitoring, mind wandering, attention switching, selective attention and increasing levels of sustained attention. As the range of evidence of how meditation can impact mental health, cognition, brain activity, mood and affect has grown, so has its popularity in pop culture with thousands of articles recommending that individuals meditate for a wide range of reasons. However, we have yet to understand clearly why people today chose to meditate and what their goals might be.

A common issue across mindfulness meditation studies is a lack of clear understanding of participants' reasons or intentions for participating in meditation programs. Furthermore, it is not

clear if participants have clear specific intentions or general concepts of why they should meditate. Furthermore, adherence to meditation practice has been found to be a factor on how effective a meditation program will be for an individual (Lacaille et al., 2018). To explore the question of why people drop out of mindfulness meditation studies, we must first explore the question of "Why do people practice mindfulness?" that Pepping et al. (2016) addressed using mixed-methods research. They found that in both qualitative and quantitative analyses, the most frequently cited reason for commencing and continuing meditation practice was to alleviate emotional distress and enhance emotion regulation. A substantial proportion of participants also reported continuing meditation to enhance well-being, though very few commenced or continued meditation practice for spiritual or religious reasons. Pepping et al. (2016) did state that their sample was limited by its cultural homogeneity and that a more diverse sample might reveal a different mix of intentions to practice mindfulness meditation. Those results led to the goal of this master's thesis to develop a measure to assess people's reasons for participating in mindfulness meditation programs and to help these individuals develop more concrete intentions.

1.2 Previous research exploring meditation intentions

The purpose of this thesis was to investigate individual differences in the reasons or intentions people have for pursuing mindfulness meditation programs. Below, I summarize past research that will help identify the different categories of intentions typically reported. Shapiro (1992) examined goals and expectations for practicing meditation in a group of 27 meditators who had signed up for an intensive Vipassana meditation retreat, a type of meditation practice wherein meditators sit in formal silent meditation for long periods of time. Ten participants (37 %) reported self-regulation as their motivation, nine (33.3 %) identified self-liberation, six (22.2 %) identified self-exploration as their primary motivation, and two were classified as identifying

'other' reasons. Interestingly, Shapiro (1992) also found that reasons for practicing meditation shifted somewhat from self-regulation, to self-exploration, to self-liberation as meditation experience increased, with experienced meditators more likely to identify self-liberation as their motivation. Therefore, indicating that motivations for practicing meditation are likely not stable through a program and will change depending on the participants experience of the meditation program.

Carmody and Baer (2009) also examined reasons for engaging in mindfulness meditation practice in a sample of 309 participants attending a mindfulness-based stress reduction program for stress-related difficulties. Based on the earlier research of Shapiro (1992), participants in Carmody and Baer's study were asked to rate the importance of two reasons in each of the domains of self-regulation, self-exploration, and self-liberation. The maximum score for each type of reason was 10, and results revealed a high score for self-regulation (9.34), self-exploration (8.35), and self-liberation (8.26). Furthermore, reasons to meditate were largely unrelated to outcome measures of psychological distress, a finding difficult to interpret easily because of the low variability of the intention ratings. That study raises a methodological concern of potential near ceiling effects in measures that make it difficult to compare the reasons within and across individuals.

Pepping, Walters and Davis (2016) found four major themes in a thematic analysis from 190 adults attending a university and answering the question of why they started practicing meditation. The themes were reduction of negative experiences, well-being, introduction by an external source, and religious/spiritual reasons. In that study, 94.74 % referred to beginning mindfulness meditation to cope with or reduce negative experiences, especially negative

emotional experiences involving stress, anxiety, panic, and depression, and 31.05 % referred to the use of mindfulness meditation as a tool for enhancing aspects of their lives, such as increased happiness, greater self-awareness, improved performance, and greater alertness and concentration. Quantitative analysis of ratings of the importance of beginning meditation demonstrated that the four top reasons were to feel calmer, more relaxed, to reduce anxiety, and to regulate emotions more effectively. In contrast, very few participants reported commencing or continuing mindfulness meditation for spiritual or religious reasons. Those particular results may have been due to the specific sample consisting of university students in an urban center, a population that has reported very low levels of religious affiliation and a major focus on improving themselves for career opportunities (Bowman & Small, 2012).

Converging evidence from all three studies demonstrates that meditators are interested in emotional control, increasing positive affect, cognitive enhancement and stress relief. A minority of meditators are also interested in spiritual and psychological exploration. These reasons informed our choice of the proposed subscales for the Meditation Intentions Questionnaire. In our questionnaire we decided to use the term “intentions” rather than “reasons” based on the consideration that the exercise of answering the questionnaire goes beyond an assessment and provides a way for participants to explore, why they meditate and to impart intentionality throughout their meditation practice.

Furthermore, the purpose of the MIQ encompasses the possibilities of its usage to assess individuals. In particular, the integration of the MIQ in intake procedures of participants starting meditation programs may help facilitators understand what participants expectations for meditation are. This information on participants expectations, intentions and goals can then be

used for further personalization of programs. By being administered at multiple time points in a meditation program the MIQ could also be used to support the motivations of participants in meditation programs by tracking their progress of achieving their intentions and goals through a program. Finally, the MIQ may have the ability to explain some relationship between adherence to meditation programs and setting intentions for meditation programs.

1.3 Introduction to the facets of the meditation intentions questionnaire

In addition to selecting the intentions for the subscales, it was important to clearly define those dimensions and to delineate examples and possible subcategories that may or may not fit with the factor structure discovered in preliminary analysis. These are described below.

1.3.1 Cognitive Enhancement

Cognitive enhancement is the act of improving mental functions such as memory, intelligence, motivation, attention, and concentration through some methodology such as meditation. The most popular forms of cognitive enhancement in normal populations are often memory and concentration. Meditation studies in non-clinical and clinical samples often explore the change in cognition that follows meditation. Previous studies have found various cognitive benefits in those practicing mindfulness meditations. Zeidan, Johnson, Diamond, David and Goolkasian (2010) found that a brief mindfulness meditation intervention improved performance on several cognitive tasks, in particular these tasks measure change in sustaining attention and executive processing efficiency. These are two cognitive functions that relate highly to everyday performance in problem solving, reasoning and reaction time. Pepping et al. (2016) found various categories of why people choose to meditate including: reduction of negative experiences, well-being, greater self-awareness, improved performance, greater alertness and

concentration. It appears that improved performance, greater alertness and concentration are good examples of cognitive functions that would fall under the category of cognitive enhancement intentions.

1.3.2 Emotional Control

A growing body of research supports the claim that emotion is a key target of mindfulness practice, and therefore learning to develop a greater awareness of the variability in emotions and their textures not only experienced in the head but in the body and to help regulate one's emotions will have beneficial effects on well-being. For example, a greater tendency to attend to one's present moment experience and the acceptance of that moment is associated with a greater ability to identify and manage one's negative emotions (Coffey, Hartman & Fredrickson, 2010). This means that awareness of a negative emotional state can be controlled, once an individual is made aware of it, and thus can be reversed. Practicing this awareness can help one understand the effects of ruminative thinking and mood swings, which are said to be causes of depression, to learn to cope with them and decrease their negative impact on your life. (Jones, 2018)

1.3.3 Positive Affect

Positive affect is used as a catch all term for any increased happiness, widening the experience of joyful moments and generally more consistently attaining positive states of mental being (Arora & Sharma, 2018). It is often stated as a desired outcome for those with depression-based symptomology or difficulty experiencing emotion (i.e. alexithymia). Most research on mindfulness meditation targets the alleviation of negative affect and remains silent on the effects of positive affect. One notable exception is an experience sampling study that randomized adults with residual symptoms of major depression (N = 130) to an 8-week mindfulness-based

intervention or waitlist control (Geschwind et al. 2011). The study revealed greater pre- to post-intervention increases in day-to-day positive emotions and reward responsiveness for the intervention group. Less known, at present, are the effects of MM on day-to-day positive emotions within nonclinical samples. Loving and kindness meditation (LKM) has often been shown to be particularly effective at boosting positive emotion as a result of its focus on cultivating compassion and kindness. Two meta-analyses of LKM interventions demonstrated improved health and well-being (Galante et al. 2016) and positive emotions respectively (Zeng et al. 2015). A more recent study comparing MM and LKM interventions found that both significantly increased positive emotions (Fredrickson et al., 2017). Generally, it was clear based on previous findings than many people entering meditation programs would be interested in achieving greater positive affect as a major benefit of practising meditation.

1.3.4 Stress Relief

Mindfulness meditation has been shown to decrease stress both when measured using physiological correlates of stress such as blood pressure and hypertension (Ponte et al., 2018) and when measuring psychological self-report measures of decreased stress (Goyal et al. 2014). Many of the studies that have explored the impact of MBIs on stress have focused on populations with elevated symptoms in Generalized Anxiety disorders (GAD), diabetes, addictions and heart issues (Hoge et al., 2013). In these studies, it has been found that MM can significantly decrease the impact of acute stress and help regulate the symptoms related to GAD, addiction and hypertension (Hoge et al., 2013). Recently, in a study of relevant biomarkers of acute stress reduction in populations with GAD, mindfulness-based stress reduction (MBSR) was found to significantly increase biomarkers related to increased resilience to acute stress, the first finding of its kind (Hoge, 2018).

Studies exploring neural correlates of stress reduction as a result of meditation have found that pathways in the brain implicated in stress such as the amygdala have decreased activation following a 3-day meditation intensive program, indicating increased resilience to stress as a result of meditation (Taren et al., 2015). Although many of these results need further exploration to better understand what aspects of meditation particularly impact stress, the preliminary evidence of neural correlates supports the role of meditation on stress reduction.

1.3.5 Spiritual Discovery

Historically, meditation has been an essential element in nearly all contemplative religious and spiritual traditions. This includes not only the Eastern Hindu/Vedic and Buddhist traditions, upon which most of the meditation research has been carried out, but also Judaism, Christianity, and Islam (Goleman, 1988). The goal has been liberation from the egoic self (Walsh & Vaughan, 1980), developing a sense of harmony with the universe, and the ability to increase one's compassion, sensitivity, and service to others. Therefore, we hypothesized that an unknown proportion of individuals entering meditation program do so to explore spiritual or religious experiences.

1.3.6 Psychological Discovery

Somewhat distinct from spiritual discovery, psychological discovery is a summary category for the exploration of the self, consciousness, purpose through meditative practice. This was one of the original goals of Buddhist meditation, a type of meditation focused on cultivating an attitude of deep compassion for the world, through selflessness. Here, one can spend much time exploring their thoughts, understanding themselves, their feelings, their mind and exploring realizations such as one’s purpose in life. Shapiro (1992) identified this stage of meditation

intention as seeking self-exploration. Self-exploration goals included statements such as "want to learn more about myself"; "want to see how my mind works"; "want to understand whether this relationship (job) is right for me." The study found that 26% of participants had the goal of self-exploration as their intention for meditation. I would expect individuals who are atheist or agnostic but still interested in self-exploration to be highly interested in this goal of meditation.

1.4. Objectives and Hypotheses

The purpose of this thesis was to develop a brief psychometric measure of mindfulness meditation intentions using the most up to date psychometric procedures. Confirmatory factor analysis (CFA) and exploratory factor analysis (EFA) are similar techniques, but in exploratory factor analysis (EFA), the factor structure is not hypothesized but simply explored and provides information about the numbers of factors required to represent the data. In exploratory factor analysis, all measured variables are related to every latent variable. In confirmatory factor analysis (CFA), researchers can specify the number of factors required in the data and which measured variables (i.e., the items) are related to specific latent variables (i.e., subscales). Confirmatory factor analysis (CFA) is a tool that is used to confirm or reject the measurement theory. We chose CFA since we had an apriori set of proposed factors for the questionnaire.

We proposed six distinct categories of intentions (see Table 1) and developed a pool of items (8 per category) to assess individual differences in the salience of these intentions. The meditation intentions questionnaire (MIQ) was used in a 4-week meditation study involving graduate students from various fields of study and universities. Therefore, the main hypothesis was a six-factor structure corresponding to the six categories. It was expected that these factors would correlate to some extent because of some conceptual overlap or theoretical relations. In

particular, it was hypothesized that stress reduction may correlate with positive affect and emotional control, and psychological discovery may correlate with spiritual discovery because they overlap with the ideas of discovering purpose and meaning. The hypothesized model was to be tested using confirmatory factor analysis. The hypothesized model would be supported to the extent that the six-factor model provides a close fit to the data. Failure to obtain good fit could indicate that fewer or more factors are needed or that the way we have conceptualized the categories needs to be modified. Failure to obtain a good fitting model was to be followed up with exploratory factor analysis.

We used a newer technique referred to as exploratory structural equation modeling (ESEM) as a follow-up to a reasonable CFA model. ESEM incorporates the advantages of the less restrictive EFA (i.e., allowing cross-loadings) and the more theory driven and parsimonious CFA in which the factors are defined by the researcher (i.e., the number of factors and the variables that define the factors). Generally, ESEM results in improved model fit as well as deflated inter-factor correlations that, in turn, improve the discriminant validity of the factors as well as providing a more realistic representation of the data (Morin and Maïano, 2011; Arens and Morin, 2016; Tóth-Király et al., 2017). Our intent in this study was to start with a pool of 48 items but to reduce that pool to a briefer feasible measure of 24 items (4 items per category). ESEM was used to assist in identifying the weakest items as defined by those with high cross loadings (i.e., items that have high loadings on other factors relative to the loadings on their intended factor).

In addition to exploring the factor structure of the meditation intentions questionnaire, we analyzed the relationship between the indicated subscales and measures of stress, anxiety and affect. That preliminary investigation explored the extent to which meditation intentions related to how individuals self-report on their stress, affect, anxiety and depression symptoms. A few

hypotheses related to these relationships were proposed. The first proposed that those who score high on intentions for stress relief will also score high on stress and anxiety self-report scales administered at the beginning of the 4-week mindfulness program. The second proposed that those who score high on intentions for emotional control will correlate with self-reported scores of depression as measured by the DASS. The third proposed that those who score high on intentions for increased positive affect will correlate with those rating high on self-reported negative affect.

Chapter 2: Method

2.1. Developing the items for the meditation intentions questionnaire

After reviewing the qualitative and quantitative findings of the reasons for which people pursue meditation practice in Pepping et al. (2016) and Shapiro (1992), I then explored a preliminary list of reasons for which people pursue meditation practice. I generated a large list of over 100 items based on qualitative data from Pepping et al. (2016) and my experience facilitating meditation programs. These questions were then categorized into tentative subscales and reviewed by a committee of relevant experts (both in test construction and meditation). (See Appendix C for original version of the questionnaire). Experts included one professor in statistics and psychological measurement development and two professors with expertise in meditation research. The experts each reviewed all items and recommended which items they felt fit the proposed subscales best. Based on feedback from the reviewers, the original 8 subscales were collapsed into 6 subscales. In particular stress relief and relaxation were collapsed into one subscale, and spiritual discovery and religious exploration were collapsed into another subscale. Semantic and theoretical feedback led to a pool of 48 items, with 8 items per subscale, plus an open-ended question and rating scale asking participants what other goals they felt were

important to them. In deciding on the number of items, the objective was to produce a shorter 24-item questionnaire (with 4 items per scale) by selecting the best items following factor analyses. (See Appendix D for the 24-item version of the questionnaire). Each question was rated on a five-point Likert scale with the following anchors: 1 “Not at all a goal”, 2 “A minor goal”, 3 “A somewhat important goal”, 4 “An important goal”, and 5 “A leading goal”. The decision to use these specific anchors was based on wanting to help participants explore the subtleties of how important each goal was to them and to help them discriminate between and informally rank those goals. It was decided not to use a formal ranking system because ranking data is not amenable to the conventional exploratory and confirmatory factor analytic procedures. Finally, because the salience of specific goals may not be well established at the beginning of a meditation program, participants were given the option to endorse fewer concrete goals while they explored meditation and learned more about the possibilities.

Examples of items for each proposed scale are presented in Table 1.

Table 1

Example of items per subscale of Meditation Intentions Questionnaire

Subscale	Item sample
Cognitive Enhancement	“Improve my ability to stay on task
Emotional Control	“Manage my emotions more effectively”
Greater Positive Affect	“Be more content”
Stress Relief	“Let go more easily of stressors”
Spiritual Discovery	“Explore my connections with universe”
Psychological Discovery	“Discover more about my consciousness”

2.2 Participants

Participants for this thesis were 145 graduate students who completed the Meditation Intentions Questionnaire (MIQ). The data were obtained from a larger study in a sample of 223 graduate and professional students at Canadian universities exploring the effects of a 4-week mindfulness program on psychological well-being. Of the 223 students, only 156 completed demographics data and a further 11 did not complete the MIQ, leading us to our final sample of 145 students. Demographics are provided in Table 2.

2.3 Recruitment and Research Design

A complete description of the larger study design can be found at https://osf.io/vgbzq/. Briefly, participants were randomly assigned to one of two groups, resulting in 112 participants in the experimental condition and 111 participants in the delayed-start control condition. Participants were recruited through internal university emails and social media posts through Facebook and Twitter. Random assignment was conducted via a method described by Bruns (https://exceljet.net/formula/randomly-assign-people-to-groups). As a result of a university strike for graduate students at the university where most participants were recruited, the study was delayed and caused 67 participants to drop-out of the study. A further 11 participants did not complete the MIQ. Therefore, leaving 85 participants in the control and 83 participants in the experimental condition for the analysis of the MIQ.

Data was collected at three points in time (i.e. T1 (0 weeks), T2 (4 weeks), and T3(8 weeks) from participants in the experimental and delayed-start control groups. Participants in the experimental condition completed the 4-week mindfulness program first at T1, followed by participants in the delayed-start control condition in T2 (4 weeks later). The entire study was conducted online through OWL – the University of Western Ontario's online learning system.

The self-report questionnaires were presented through Qualtrics – an online data collection platform. The questions of the MIQ were presented in random order through a function in Qualtrics.

At T1, both groups completed the Meditation Intentions Questionnaire, and their responses were used in the psychometric analysis of the item pool for the meditation intentions questionnaire. T2 and T3 data were found to have a large attrition rate of participation, with more than 50 participants dropping out at each time point leaving us with insufficient data for repeating the item analyses or conducting test-retest or validation analyses at those time point. All participants completed various additional questionnaires at T1, assessing stress, depression, anxiety (DASS-21; Lovibond & Lovibond, 1995, PSS; Cohen, Kamarck & Mermelstein, 1983), resilience (BRS; Smith et al., 2008) and positive and negative affect (PANAS-SF; Watson, Clark & Tellegen, 1988) followed by the experimental group starting the 4-week meditation group. The intervention for this study was adapted from the mindfulness program described in the book *The Anxious Lawyer: An 8-Week Guide to a Happier, Saner Law Practice Using Meditation* (Cho & Gifford, 2016). Though the book describes specific ways in which a mindfulness practice can be integrated with the practice of law, it also provides general information about fundamental mindfulness meditation techniques.

2.4. Analytic procedure

The Meditation Intentions Questionnaire (MIQ) was analyzed using confirmatory factor analysis (CFA) rather than exploratory factor analysis given that I proposed a specific hypothesized factor structure. However, any failure to confirm the hypothesized structure might be followed up with exploratory factor analysis. The Jamovi program 0.9.1.9 (Jamovi project,

2018) was used, and given that this is a new program, the analyses were confirmed in Mplus 8.1 (Muthen & Muthen, 1998-2015) using maximum likelihood estimation. The exploratory structural equation modeling (ESEM) procedure available in Mplus was also used as a follow up to the CFA to inspect the magnitude of cross-loadings and to identify weak items.

Chapter 3: Results

3.1 Demographics

A total of 145 participants completed the Meditation Intentions Questionnaire. See Table 2 for a breakdown of demographics.

Table 2
Demographics (N= 156)

Gender	**% of Total**
Male	18.6%
Female	81.4%
Program of study	**% of Total**
Doctoral Program	39.7%
Master's Program	53.2%
Professional Degree Program	3.8%
Other programs	3.2%
Meditation Experience	**% of Total**
Yes	54.8%
No	45.2%
How long have they practiced	**% of Total**
1 - 3 months	28.2%
3 - 6 months	12.9%
6 - 12 months	14.1%
1 - 3 years	27.1%
3+ years	17.6%

3.2 CFA and ESEM of Initial Set of Items

Individual item statistics are presented in Table 3. For the most part, the mean response is in the middle of the rating scale (i.e., 3 "A somewhat important goal") or higher with a few items

with higher or lower mean responses. Variability across the items range from approximately .90 to 1.30 SD. In terms of skewness and kurtosis, only one item stands out with a high positive skewness value (i.e., SD1, "Gain new religious experiences"), indicating a low endorsement value.

The CFA model consisted of the six subscales as latent variables, each with their 8 items as indicator variables. Correlations were allowed between latent variables. The model fit indices were $\chi^2_{(1065)} = 1808.93$, $p < .001$, CFI = .845, TLI = .835, RMSEA = .069 ($CI_{90\%}$ .064 to .075) SRM = .085. These fit indices suggest that the model could be improved. The RMSEA value suggests a moderate model fit, but the CFI and TLI should be above .90, and the SRM should be under .08. In addition to the fit indices, inspection of the factor loadings (pattern coefficients) indicated that all items had strong loadings above .40 (and all were statistically significant). Correlations among latent variables were not too high to suggest combining subscales together. The highest correlation of .72 was between Positive Affect and Stress Reduction.

In order to refine the model and to reduce the number of items, an ESEM analysis was conducted. This type of analysis is not unlike a CFA but rather than forcing cross-loadings at 0, it estimates those parameters regardless of how close they would be to 0. This provides a way to identify potentially weak or problematic items that load more highly or that have substantial loadings on other factors. The fit indices for the ESEM were $\chi^2_{(855)} = 1347.87$, $p < .001$, CFI = .897, TLI = .864, RMSEA = .063 ($CI_{90\%}$ .057 to .069) SRM = .036. This fit is somewhat better than the fit for the CFA model; however, inspection of the table of loadings (see Table 4) suggests that four items in particular could be eliminated (CE5 "Be more observant", PA2 "Learn techniques to feel at ease", PA4 "Feel greater calm", PA7 "Relaxation") because they loaded more highly with other scales. The item PA3 could also be eliminated but it worked well

in the CFA and its content seemed semantically unique and highly relevant to the positive affect scale.

Table 3
Item Properties for MIQ

Items	Mean	SD	Skewness	Kurtosis
(CE1)	3.20	1.205	-.224	-.905
(CE2)	3.63	1.258	-.665	-.659
(CE3)	3.79	1.280	-.935	-.151
(CE4)	3.83	1.173	-.825	-.230
(CE5)	3.21	1.166	-.119	-.927
(CE6)	3.65	1.256	-.608	-.718
(CE7)	2.57	1.317	.309	-1.138
(CE8)	3.23	1.359	-.317	-1.146
(EC1)	3.61	1.186	-.562	-.634
(EC2)	3.76	1.238	-.755	-.498
(EC3)	3.69	1.211	-.739	-.304
(EC4)	3.35	1.228	-.542	-.553
(EC5)	3.63	1.280	-.621	-.642
(EC6)	3.63	1.229	-.611	-.616
(EC7)	3.47	1.242	-.557	-.660
(EC8)	3.61	1.232	-.521	-.772
(SR1)	4.14	.962	-1.183	1.192
(SR2)	3.26	1.225	-.308	-.849
(SR3)	3.97	1.000	-.832	.231
(SR4)	4.00	1.061	-.850	-.077
(SR5)	4.14	.913	-1.015	.602
(SR6)	3.83	1.298	-.813	-.572
(SR7)	4.07	.969	-.974	.470
(SR8)	3.70	1.242	-.630	-.738
(PA1)	3.18	1.278	-.119	-1.004
(PA2)	3.96	.985	-.977	.785
(PA3)	3.85	1.036	-.678	-.355
(PA4)	3.72	1.091	-.620	-.332
(PA5)	4.02	1.051	-.843	-.199
(PA6)	3.77	1.149	-.671	-.422

(PA7)	3.95	1.002	-.867	.287
(PA8)	3.34	1.151	-.292	-.682
(SD1)	1.46	.972	2.271	4.455
(SD2)	2.12	1.328	.943	-.394
(SD3)	2.23	1.328	.714	-.767
(SD4)	1.91	1.252	1.290	.496
(SD5)	1.78	1.250	1.488	.966
(SD6)	2.32	1.338	.604	-.898
(SD7)	2.24	1.330	.679	-.861
(SD8)	2.09	1.338	.910	-.454
(PD1)	3.06	1.327	-.012	-1.218
(PD2)	2.75	1.382	.184	-1.305
(PD3)	3.32	1.269	-.218	-1.014
(PD4)	2.74	1.423	.182	-1.307
(PD5)	3.03	1.282	-.065	-1.077
(PD6)	3.13	1.265	-.083	-1.013
(PD7)	3.15	1.298	-.055	-1.150
(PD8)	3.43	1.273	-.296	-1.104

Table 4

Factor loadings (including cross-loadings) of the ESEM

Items	CE	EC	PA	SR	SD	PD
CE 1	**0.713**	0.092	-0.185	0.031	-0.108	0.129
CE 2	**0.877**	0.027	-0.163	0.117	0.013	-0.013
CE 3	**0.920**	-0.005	0.168	-0.129	-0.042	-0.159
CE 4	**0.817**	0.005	0.113	0.003	0.099	-0.068
CE 5	**0.372**	0.024	-0.127	-0.015	-0.125	0.395
CE 6	**0.804**	0.042	0.078	-0.098	-0.047	-0.021
CE 7	**0.620**	-0.189	-0.271	0.306	0.012	0.027
CE 8	**0.518**	-0.114	0.204	-0.047	0.051	0.099
EC 1	-0.063	**0.852**	0.064	0.023	-0.043	0.017
EC 2	-0.051	**0.840**	0.030	0.070	-0.059	0.066
EC 3	0.014	**0.522**	0.077	0.163	0.059	0.054
EC 4	0.071	**0.898**	-0.071	-0.055	0.042	0.020
EC 5	-0.007	**0.914**	-0.043	-0.010	0.003	-0.052
EC 6	0.070	**0.751**	0.129	0.035	-0.044	-0.042

EC 7	-0.014	**0.867**	-0.090	-0.002	0.004	0.028
EC 8	-0.005	**0.612**	0.124	0.044	0.046	0.151
PA 1	0.083	-0.034	**0.413**	0.021	0.196	0.197
PA 2	0.062	0.052	**0.232**	0.432	-0.032	0.067
PA 3	0.067	0.177	**0.271**	0.054	0.024	0.282
PA 4	0.056	0.079	**0.341**	0.408	-0.028	0.200
PA 5	0.009	0.090	**0.459**	0.229	-0.027	0.049
PA 6	-0.023	0.142	**0.538**	0.067	-0.099	0.114
PA 7	-0.023	-0.063	**0.248**	0.484	-0.173	0.181
PA 8	0.021	0.179	**0.550**	0.084	0.196	-0.031
SR 1	0.031	-0.011	0.101	**0.789**	0.076	-0.084
SR 2	0.036	0.158	0.121	**0.595**	0.097	-0.077
SR 3	0.013	-0.130	0.130	**0.729**	-0.163	0.145
SR 4	0.046	0.158	-0.053	**0.733**	0.006	0.061
SR 5	0.231	0.279	0.008	**0.389**	0.138	-0.136
SR 6	0.010	0.031	0.277	**0.606**	-0.083	-0.020
SR 7	0.002	0.091	0.278	**0.435**	-0.049	-0.195
SR 8	-0.001	0.206	0.206	**0.492**	0.000	-0.170
SD 1	-0.003	0.066	-0.194	0.073	**0.791**	-0.044
SD 2	-0.070	-0.004	-0.162	0.069	**0.841**	0.134
SD 3	0.027	-0.098	0.290	-0.085	**0.511**	0.207
SD 4	0.040	0.025	-0.110	0.035	**0.979**	-0.139
SD 5	-0.024	0.005	0.072	-0.044	**0.543**	0.253
SD 6	0.118	0.001	0.235	-0.179	**0.381**	0.152
SD 7	-0.074	0.000	0.063	0.086	**0.786**	0.046
SD 8	-0.029	-0.054	0.092	-0.048	**0.828**	0.052
PD 1	-0.027	-0.024	-0.060	0.088	0.154	**0.795**
PD 2	0.154	0.024	0.129	-0.206	0.010	**0.615**
PD 3	-0.033	0.046	0.025	0.079	0.200	**0.706**
PD 4	0.174	-0.098	0.196	-0.065	0.279	**0.478**
PD 5	0.153	0.030	0.029	-0.050	-0.018	**0.777**
PD 6	0.131	0.137	0.212	-0.108	-0.013	**0.577**
PD 7	-0.006	0.126	-0.041	-0.092	0.091	**0.729**
PD 8	-0.074	0.057	0.071	0.001	0.085	**0.729**

CE = Cognitive Enhancement, EC = Emotional Control, PA = Positive Affect, SR = Stress Relief, SD = Spiritual Discovery, PD = Psychological Discovery.

The Meditation Intention Questionnaire demonstrated discriminant validity, in that the correlations in Table 5 demonstrate medium to small correlations between subscales but not too high, (less than .60). This indicates that each subscale measures a different although some are related (e.g., SD and SP).

Table 5
Correlations among the factors in the ESEM

Items	CE	EC	PA	SR	SD	PD
CE	1					
EC	0.240	1				
PA	0.240	0.362	1			
SR	0.130	0.404	0.335	1		
SD	0.086	0.107	0.137	-0.100	1	
PD	0.358	0.194	0.343	0.027	0.533	1

CE = Cognitive Enhancement, EC = Emotional Control, PA = Positive Affect, SR = Stress Relief, SD = Spiritual Discovery, PD = Psychological Discovery. Correlations above .107 are significant at alpha = .01.

3.3 Development of the Short-form Meditation Intentions Questionnaire (24)

A 24-item version of the questionnaire was produced by selecting four items for each of the six subscales. These four items for each scale were chosen based on items that had not been deleted in the previous stage (48 – 4 = 44 items). Given that the 44 items had comparable loading values, the items that were least homogeneous semantically and provided a broader coverage of the scale were selected. Specifically the chosen items cover the following aspects: Cognitive Enhancement (focus, memory, multitasking and concentration), Emotional Control (control feelings, emotional reactions, regulate my emotions, situational control of emotions), Greater Positive Affect (happiness, contentment, serenity, appreciation of life), Stress Relief (anxiety, worrying, stress relief, fear associated with stress), Spiritual Discovery (enlightenment,

spirituality, greater forces, religion), and Psychological Discovery (consciousness, mind exploration, self-discovery and self-reflection).

Finally, a CFA of the six-factors with four items each was tested and revealed a good fit: $\chi^2_{(237)} = 382.55$, $p < .001$, CFI = .916, TLI = .902, RMSEA = .065 ($CI_{90\%}$ .053 to .077) SRM = .076. Although fit indices with values .05 or smaller for RMSEA and .95 or higher for CFI and TLI are considered ideal and point to a close fit, values under .08 for RMSEA and above .90 for CFI and TLI are considered good and suggest an approximate fit.

Table 6 provides a list of the 24 items along with their standardized loadings. All these coefficients are statistically significant ($p < .001$) and have adequate values ranging from .482 to .907. Correlations among the scales (i.e., latent variables) are presented in Table 8. These range in values from -.109 to .649 suggesting that correlations are not too high to suggest redundancy between the scales.

Mean scores for the scales were calculated by averaging their four items. Table 7 presents the means, standard deviation, skewness and kurtosis values, as well as Cronbach alpha internal consistency values. As can be seen, most scales have a mean value just above the mid-range score of 3 “A somewhat important goal” but with Spiritual Discovery having a lower mean score of 2 “A minor goal”. The skewness and kurtosis values suggest little departure from normality, with the exception that the Spiritual Discovery scale does show a moderate level of positive skewness. Cronbach alpha values range from .697 to .917 indicating adequate levels of internal consistency, especially considering the small number of items per scale.

Table 6
Factor loadings mean of MIQ-24 items (including cross-loadings) of final CFA

Factor	Item	Estimate
Cognitive Enhancement	Improve my memory	0.586
	Improve my ability to multitask	0.485
	Increase my concentration	0.853
	Improve the amount of time I can stay focused	0.876
Emotional Control	Better control my emotional reactions	0.894
	Gain better control of my feelings	0.814
	Better regulate my emotions	0.845
	Have more control over how I react in different emotionally charged situations	0.878
Greater Positive Affect	Better appreciate the little things in life	0.693
	Be happier	0.666
	Achieve serenity	0.482
	Be more content	0.640
Stress Relief	Stress relief	0.534
	Have greater control over my anxiety	0.725
	Reduce the amount of time I spend worrying	0.788
	Reduce the fear associated with stress	0.640
Spiritual Discovery	Spiritual exploration	0.907
	Work towards enlightenment	0.702
	Experience a force greater than myself	0.781
	Gain new religious experiences	0.726
Psychological Self-discovery	Discover more about my consciousness	0.779
	Exploring my mind	0.810
	Self-discovery	0.802
	Gain a deeper understanding of myself	0.777

Table 7
Scoring of Meditation Intentions Questionnaire-24

Subscale	**N**	**Mean**	**SD**	**Cronbach Alpha**	**Skewness**	**Kurtosis**
Cognitive enhancement	145	3.357	1.001	.785	-.549	-.459
Emotional control	145	3.584	1.105	.917	-.549	-.566
Positive affect	145	3.566	0.829	.697	-.289	-.432
Stress Relief	145	3.735	0.902	.763	-.500	-.421
Spiritual Discovery	145	2.000	1.045	.854	1.086	.358
Psychological Discovery	145	3.090	1.119	.869	-.119	1.037

CE = Cognitive Enhancement, EC = Emotional Control, PA = Positive Affect, SR = Stress Relief, SD = Spiritual Discovery, PD = Psychological Discovery.

Table 8
Correlations among the factors in 24-item CFA model

Items	**CE**	**EC**	**PA**	**SR**	**SD**	**PD**
CE	1					
EC	0.238	1				
PA	0.390	0.529	1			
SR	0.209	0.532	0.512	1		
SD	0.031	0.089	0.227	-0.109	1	
PD	0.387	0.230	0.564	0.013	0.649	1

CE = Cognitive Enhancement, EC = Emotional Control, PA = Positive Affect, SR = Stress Relief, SD = Spiritual Discovery, PD = Psychological Discovery. Correlations above .230 are significant at alpha = .01.

3.4 Exploratory analysis of the MIQ (24) and other measures

An investigation of the relationship between the results of the MIQ and the other scales employed in the study is summarized in Table 9. All of the other scales were found to have Cronbach alpha scores of >.80 indicating adequate levels of internal consistency. The results revealed medium significant positive correlations between the emotional control subscale of the MIQ and the Perceived Stress Scale (PSS) a scale that measures the self-reported stress of an

individual. Weak but significant positive correlation was identified between emotional control and the three subscales of the Depression, anxiety and stress scales (DASS), a scale that measures the propensity for depression, anxiety and stress symptomology, and a medium positive correlation with the negative affect scale a measure of the negative affect an individual is experiencing.

The stress relief subscale of MIQ was also found to have a strong significant positive correlation with the PSS, a significant medium positive association with the three subscales of the DASS and both the positive affect and negative affect scores of the PANAS scale. This relates to our hypothesis of the relationship between those that are experiencing more negative emotions, more stress, lack of control of emotions as measured by self-report scales would be more interested in exploring how they could improve their mood, their control and coping of their stress and better controlling their mood while experiencing greater positive affect.

Table 9
Correlations of MIQ short version subscales with other questionnaires

Items	**PSS**	**BRS**	**DASS D**	**DASS A**	**DASS S**	**PAS**	**NAS**
CE	.063	.052	-.011	-.077	-.088	-.075	.083
EC	.385**	.057	.238**	.176*	.249**	-.148	.314**
PA	.156	-.066	.129	.029	.060	-.135	.145
SR	.531**	.089	.306**	.509**	.485**	-.235**	.528**
SD	-.146	-.088	-.078	-.086	-.134	.001	-.143
PD	-.092	-.096	-.070	-.096	-.130	-.005	-.043

PSS= Perceived Stress Scale, BRS = Brief Resilience Scale, DASS D = Depression, Anxiety and Stress Scale, Depression subscale, DASS A = DASS Anxiety subscale, DASS S = DASS Stress subscale, PAS = Positive Affect Score for Positive Affect Negative Affect Schedule, NAS= Negative Affect Score on PANAS, CE = Cognitive Enhancement, EC = Emotional Control, PA = Positive Affect, SR = Stress Relief, SD = Spiritual Discovery, PD = Psychological Discovery.

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Chapter 4: DISCUSSION

4.1 Evaluating the Project Objectives

The first objective of this project was to create a reliable measure of individual differences in intentions for those entering mindfulness meditation programs. Rather than using a ranking approach of the intentions, we promoted distinction of the intentions within each individual assessment by using a rating scale with anchors intended to promote distinction between the salience and importance of each of the intentions. The confirmatory factor analyses provided strong support for the hypothesized structure. The number of proposed dimensions and their meaning was supported, and only minor modifications consisting of the removal of a few items were required to improve the model fit.

In terms of the validity of the instrument, at the early stage of test construction we focused on promoting content validity of the collection of intentions and their proposed items. As presented in the introduction, I conducted a comprehensive review of intentions and asked experts to review the proposed items. In terms of discriminant validity, it was clear that the six scales are distinct, and that the six categories of intentions are therefore non-redundant. The highest correlation was between spiritual and psychological discovery. Even there, the correlation was not excessively high, thus providing evidence of unique aspects of these two intentions.

When selecting the items for the MIQ-24, I resorted not necessarily to the items with the highest loadings. After removing a few items, all others had acceptable loadings. Instead, I aimed to select the set of four items that would provide broad coverage of the concepts (cognitive enhancement, emotional control, positive affect, stress relief, spiritual discovery and psychological discovery). In the end, the MIQ-24 scales conform to a clear and unambiguous factor structure, and they show adequate reliability for brief scales (see Appendix D for the MIQ-

24) consisting of only four items each. and an adequate level of distinctiveness based on their pattern of intercorrelations.

In terms of assessing preliminary evidence of criterion validity of the MIQ, relationships were investigated between its subscales and measures of mental health such as stress, emotional control and affect. Those analyses addressed whether or not meditation intentions about stress, emotional control, positive affect is set by individuals experiencing higher stress, negative affect and mood dysregulation as measured by self-report measures administered at the beginning of the study. The first hypothesis was that those who score high on intentions for stress relief would also report high levels of stress and anxiety at the beginning of the 4-week mindfulness program. Hypothesis 2 was that those who score high on intentions for emotional control will also report high scores of depression as measured by the DASS. Hypothesis 3 stated that those who scored high on intentions for increased positive affect will also report high levels of negative affect.

Our analysis supported two of the three hypotheses. A bivariate Pearson correlation demonstrated a medium to strong positive association between the intention to increase stress relief through meditation practice as measured by the MIQ and scores on the PSS and the stress subscale of the DASS two related measures of stress. This relationship suggests that those who want to meditate because they seek techniques for stress relief may do so because they actually report a high level of stress. The stress relief intention subscale may be valuable for helping participants with stress issues, begin to explore how meditation can be a tool for helping them cope with stress. By setting the intention that they want stress relief through meditation practice they begin the journey towards that goal.

The second hypothesis demonstrating a low to medium positive association between the intention to increase emotional control through meditation practice and scores on the DASS depression scale and the negative affect score, which are two measures of emotion related symptoms indicates that there is at least an association between those seeking meditation to support them in learning greater emotional control and dealing with depression and negative affect issues.

Finally, the third hypothesis was not supported as the correlation between those setting intentions for greater positive affect and reports of experiencing high levels of negative affect was only .145 and not significant. It was expected that those dealing with greater issues with negative affect see meditation as a possible way to improve their affect and experience greater positive affect in their lives. Based on the lack of support for this hypothesis, it could be that participants who report negative affect do not expect or have an intention for a large shift like positive affect but instead prioritize to reduce stress which they may see as a cause for their negative affect.

With some indirect findings and weak to medium correlations the relationships are not completely clear and obviously further studies would help understand the meanings of these findings. In particular the subscale of intention to improve emotional control was related to almost all of the self-report criterion measures, indicating that those endorsing that intention were likely to have a variety of self-reported symptomology including stress, negative affect, depression, anxiety and low resilience. This may be as a result of no direct related measure of emotional control being included in the study, although anxiety and depression on the DASS may indeed be overlapping concepts.

A particular strength of this study was the recruitment strategy and sample of graduate students. Many studies now depend on self-report evidence collected from online samples, which may introduce measurement error, we saw no evidence of careless responding in this study. However, the graduate student sample in the present study seemed more likely to respond carefully because they were motivated by their intention to participate in a meditation program.

4.2 Limitations

It is important to point out that the study's main limitation was the use of a small sample (N=145) to conduct factor analyses of the items of the MIQ. Normally, minimal sample sizes of 200 to 300 cases are recommended for CFA and ESEM analyses. Therefore, the results of this thesis need to be treated as preliminary and should be replicated in a larger cross validation sample. Even with this small sample, the study confirmed the hypothesized factor structure with only minor modifications consisting of the removal of a few items. Had we not been able to support the hypothesized factor structure, it would have been difficult to determine if lack of support was due to the wrong model or imprecise estimates.

A second limitation of the current study was the lack of diversity in our sample, we used a group of graduate and postgraduate students. The participant group may not be representative of the general population and is heavily represented by women (over 80% female). In particular female participants have been shown to be more self-aware and driven to seek methods for coping with mental health difficulties (Mackenzie, Gekoski & Knox, 2006). This could result in a gender difference we could not explore in the current study. Therefore, results found in this study should be taken with some caution and usage of the questionnaire in other populations is

needed to see if it is still reliable in assisting in providing a methodology for setting goals and intentions for a meditation program.

We also note that our participants may only have mild symptoms of depression, anxiety and stress and since many are psychology students they may have been motivated to join this study for proactive symptom reduction as opposed to reactionary symptom reduction, this may explain some of the weak to medium relationships found. Future studies should explore the question of the relationship between symptom reduction and intentionality for meditation practice with other samples.

Furthermore, we did not have related measures of all subscales of the MIQ. In particular, we were missing any related self-report measures of cognitive enhancement (attention, memory or reasoning), a direct measure of spiritual exploration, a direct measure of psychological exploration and a more direct measure of emotional control in particular. This limits us from knowing the relationship between setting goals for a meditation program and people's self or objective reports of cognitive functioning and their individual differences in spirituality, religiosity, and various other related dimensions.

4.3 Implications

The successful development of the Meditation Intentions Questionnaire has potential to lead to helping participants who are contemplating mindfulness meditation programs. The MIQ may help motivate individuals throughout a program to explore how they are improving towards the goals they have set, and this implementation could lead to decreased drop-out in meditation

programs as well as support the education of individuals entering meditation programs about possible goals and outcomes.

The present thesis moved us closer to answering the question of why people practice meditation that Pepping et al. (2016) posed at the beginning of his study. The MIQ has the potential to help individuals entering meditation programs explore what they would like to get out of meditation practice. By further exploring the relationship between goals, intentions and outcomes of meditation programs, we will be able to explore how to improve meditation programs. For example, if we are aware that a group of individuals is interested in cognitive enhancement as a major reason for practicing, we might recommend the use of focus meditations which have demonstrated cognitive benefits in multi-tasking and concentration. If a group is interested in spiritual exploration, we might recommend a meditation program that explores Buddhist or Hindu philosophies on spirituality and how these relate to meditation practice.

4.4 Future Directions

The next stage of this research will be to collect a large sample of respondents to cross validate the factorial structure and reliability of these scales for both the regular MIQ and the short form. Other next steps for the meditation intentions questionnaire include using the MIQ with a large variety of sample populations, including diverse occupations, ages, genders, scenarios for meditation programs and other factors that might alter the question of why someone might want to explore meditation practice. Therefore, exploring continuously whether or not the MIQ is successful at helping set intentions and goals for individuals entering meditation programs.

A large research question left unanswered in this study is what the impact of the MIQ might be on the long-term motivation of meditators and on the adherence rate of meditators in meditation programs. In particular, we would recommend a future research design that tracks how intentions change over time by administering the MIQ-24 at multiple time points. By tracking changes on the MIQ and relating changes on the MIQ to adherence to the meditation program assigned, this would explore how the MIQ impacts adherence. Furthermore, the MIQ can currently be used to compare intentions across individuals but future research should look at investigating individuals' profiles of intentions. For example, analyzing the results of the MIQ in new ways to discover how a combination of intentions may result in various profiles of intentionality. These profiles might then be related to various outcomes and behaviors that might assist with the personalization of meditation programs.

4.5 Conclusion

We hope to see the MIQ-24 used in more studies exploring its reliability and applying it in as many different patient populations and scenarios for meditation programs. In particular the integration of the MIQ-24 in intake procedures of participants starting meditation programs may help facilitators understand what participants expectations for meditation are. This information on participants expectations, intentions and goals can then be used for further personalization of programs and check-ins to see how far participants feel they have come from day 1 of the program until the end of the program.

As a result of all the previous work done by Pepping et al., 2016 and Shapiro, 1992 this project was built on a strong theoretical foundation contributing to its success. Having previous qualitative data sets that indicated the types of goals individuals may have entering meditation

programs, significant experience with facilitating meditation programs and 2 experts in the study of meditation led us to a successful battery of questions. Through the use of CFA and ESEM to confirm a theoretical factor structure and to develop a short form of the questionnaire we were able to successfully develop both a questionnaire that can be used to educate and support the setting of goals for meditation programs and add a valuable tool to the toolbox of individuals, future researchers and possibly corporations in developing meditation programs that can be personalized using the results of the Meditation Intentions Questionnaire.

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Appendix A: The Mindfulness Program

The intervention for this study was adapted from the mindfulness program described in the book *The Anxious Lawyer: An 8-Week Guide to a Happier, Saner Law Practice Using Meditation* (Cho & Gifford, 2016). Though the book describes specific ways in which a mindfulness practice can be integrated with the practice of law, it also provides general information about fundamental mindfulness meditation techniques.

As described above, the mindfulness program for this study involves weekly descriptions of a mindfulness topic and guided meditation exercises. The text provided on each of the mindfulness pages was summarized from *The Anxious Lawyer* by the study authors and the guided meditations were recorded and provided by Cho and Gifford.

Appendix B: Ethics Approval

Western Research

Date: 24 November 2017
To: Dr. John Paul Minda
Project ID: 107342
Study Title: Cognitive Benefits of Mindfulness Meditation

Application Type: Continuing Ethics Review (CER) Form

Review Type: Delegated

Full Board Reporting Date: December 8, 2017
Date Approval Issued: 24/Nov/2017
REB Approval Expiry Date: 24/Nov/2018

Dear Dr. John Paul Minda,

The Western University Research Ethics Board has reviewed the application. This study, including all currently approved documents, has been re- approved until the expiry date noted above.

REB members involved in the research project do not participate in the review, discussion or decision.

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.

Please do not hesitate to contact us if you have any questions.

Sincerely,
Kelly Patterson, Ethics Officer, on Behalf of Dr. Randal Graham, NMREB Chair

Appendix C : Final version of Meditation Intentions Questionnaire (MIQ)

Meditation Intentions Questionnaire

You will be presented with a list of common goals that people try to achieve by meditating. People differ in their major goals for meditating. We would like you to explore what your goals are for meditation. Although you might have more than one goal for this meditation practice, we would like to find out which ones are more important you.

Consider the following items and use the below five-point scale to indicate how important each goal is for you to achieve through your current meditation practice.

1 = Not at all a goal
2 = A minor goal
3 = A somewhat important goal
4 = An important goal
5 = A leading goal

A = Cognitive enhancement

Cognitive enhancement is defined as improving or enhancing one or more cognitive abilities. Cognitive ability is defined as a series of skills used to facilitate mechanisms of learning, remembering, problem solving or paying attention.

1. Improve my ability to shift my attention from task to task (a)
2. Improve my ability to stay on task (a)
3. Improve the amount of time I can stay focused (a)
4. Increase my concentration (a)
5. Be more observant (a)
6. Decrease my distraction (a)
7. Improve my memory (a)
8. Improve multitasking ability (a)

B = Emotional control

Emotional control is defined as self-regulation of response to ongoing demands of experience with a range of emotion in a sufficiently flexible manner to permit spontaneous reactions as well as delay spontaneous reactions as needed.

1. Better regulate my emotions (b)
2. Manage my emotions more effectively (b)
3. Manage difficult thoughts (b)
4. Learn to be more flexible with my emotional reactions (b)
5. Have more control over how I react in different emotionally charged situations (b)
6. Control how emotional I become (b)
7. Place space between myself and my emotions (b)
8. Gain constraint on my feelings (b)

C = Greater Positive Affect

Greater positive affect is defined as achieving a greater range and experience of desirable situational responses, ranging from interest and contentment to joy and relaxation.

1. Achieve serenity (c)
2. Learn techniques to feel at ease (c)
3. Relaxation (c)
4. Be more content (c)
5. Be happier (c)
6. Get greater joy from one's life (c)
7. Gain more pleasure from the little things in life (c)
8. Feel greater calm (c)

D = Stress relief

Stress relief is defined as decreasing the degree of effect and debilitation stress has on oneself leading to a greater chance of relaxation and well-being.

1. Reduce the effects that stress has on me (d)
2. Reduce the fear associated with stress (d)
3. Let go more easily of stressors (d)
4. Decrease the amount of strain in my life (d)
5. Stress relief (d)
6. Have greater control over my anxiety (d)
7. Reduce the amount of time I spend worrying (d)
8. Notice and control my level of stress (d)

E = Spiritual discovery

Spiritual discover is defined as exploring one selves human spirit or soul as opposed to material, physical or objective things through self-study or using a religious framework.

1. I want to gain new religious experiences (e)
2. Spiritual exploration (e)
3. Explore my connections with the universe (e)
4. I want to get closer to my inner energy (e)
5. Gain a greater connection with the Divine (e)
6. Work towards enlightenment (e)
7. Experience glimpses of greater forces (e)
8. Explore my connection to other living animals and plants (e)

F = Psychological self-discovery

Psychological self-discovery is defined as the exploration of one's identity, self, mind and any other psychologically relevant questions through the study of oneself without a direct religious framework.

1. To better know my inner self (f)
2. Explore techniques for studying my mind (f)
3. Gain a greater understanding of my "self" (f)
4. Discover more about my consciousness (f)
5. Exploring my mind (f)

6. Explore my thoughts and what they mean (f)
7. Self-discovery (f)
8. Gain a deeper understanding of myself (f)

Scoring on the MIQ is done by averaging each subscale

Appendix D: Short form of Meditation Intentions Questionnaire (MIQ-24)

Meditation Intentions Questionnaire-24 Short Version

You will be presented with a list of common goals that people try to achieve by meditating. People differ in their major goals for meditating. We would like you to explore what your goals are for meditation. Although you might have more than one goal for this meditation practice, we would like to find out which ones are more important you.

Consider the following items and use the below five-point scale to indicate how important each goal is for you to achieve through your current meditation practice.

1 = Not at all a goal
2 = A minor goal
3 = A somewhat important goal
4 = An important goal
5 = A leading goal

A = Cognitive enhancement
Cognitive enhancement is defined as improving or enhancing one or more cognitive abilities. Cognitive ability is defined as a series of skills used to facilitate mechanisms of learning, remembering, problem solving or paying attention.

1) Improve the amount of time I can stay focused (13)
2) Increase my concentration (19)
3) Improve my memory (43)
4) Improve my ability to multitask (37)

B = Emotional control
Emotional control is defined as self-regulation of response to ongoing demands of experience with a range of emotion in a sufficiently flexible manner to permit spontaneous reactions as well as delay spontaneous reactions as needed.

1) Better regulate my emotions (6)
2) Have more control over how I react in different emotionally charged situations (26)
3) Gain better control of my feelings (38)
4) Control how emotional I become (32)

C = Greater Positive Affect
Greater positive affect is defined as achieving a greater range and experience of desirable situational responses, ranging from interest and contentment to joy and relaxation.

1) Achieve serenity (5)
2) Be more content (21)
3) Be happier (27)
4) Better appreciate the little things in life (45)

D = Stress relief

Stress relief is defined as decreasing the degree of effect and debilitation stress has on oneself leading to a greater chance of relaxation and well-being.

1) Reduce the fear associated with stress (10)
2) Stress relief (28)
3) Have greater control over my anxiety (34)
4) Reduce the amount of time I spend worrying (46)

E = Spiritual discovery

Spiritual discover is defined as exploring oneselves human spirit or soul as opposed to material, physical or objective things through self-study or using a religious framework.

1) Gain new religious experiences (2)
2) Spiritual exploration (11)
3) Work towards enlightenment (35)
4) Experience a force greater than myself (47)

F = Psychological self-discovery

Psychological self-discovery is defined as the exploration of one's identity, self, mind and any other psychologically relevant questions through the study of oneself without a direct religious framework.

1) Discover more about my consciousness (24)
2) Exploring my mind (30)
3) Self-discovery (42)
4) Gain a deeper understanding of myself (48)

Scoring on the MIQ is done by averaging each subscale.
Numbers in brackets indicate original placement of question in MIQ

Curriculum Vitae

Daniel Kharlas

Education

BSc, Western University, Honours Specialization Psychology	London, ON	Sept 2011-April 2016
MSc, Western University, Masters in Personality and Measurement	London, ON	Sept 2016-August 2018

Research Experience

MEDITATIONS Lab — London, ON — 2015-2018

- Currently studying meditation through mathematical models that assess the cognitive changes that occur as a result of meditation
- Previously studied the relationship between meditation, trait mindfulness, multisensory imagery and embodied imagery integrating state of the art portable technologies that measure neurological (EEG) and physiological (heart rate variability) aspects of meditation.
- Assessed new technologies that could be applied in the study of neurofeedback and meditation. This including testing the usability, data analysis and research efficacy of the MUSE headband, EPOC + headset and prospective heart rate monitors from various companies in the application of various research interests.
- Trained in the use of MatLab and R to analyze study data from various experiments
- Trained in the application EEG and heart rate monitor

Post-traumatic Stress disorder Research Unit (UH) — London, ON — 2014-2016

- Currently conducting a study assessing trauma related altered states of consciousness (TRASC)
- Previously studied a qualitative study of Treatments of Patients with Dissociative Disorders (TOPDD)
- Currently studying neurofeedback as a method to enhance positive therapeutic outcomes
- Assisting in a project examining fMRI data and HRV data to look for biomarkers indicating differences in PTSD and control
- Trained to run EEG based experiments, including analysis of data
- Trained to analyze and run heart rate variability experiments
- Created a database for scoring questionnaires and measures used during biofeedback research studies
- Learned to analyze fMRI data using a variety of programs running on MatLab
- Experience using MS Access and MS excel to create and alter databases

UWO Cerebral Systems Lab — London, ON — 2013

- Relevant applications of Neuroscience, Research Methods and Cognitive Neuroscience
- Trained cats to perform auditory experiments
- Received certification in lab safety
- Experienced working with animals in a clinical research setting
- Observed veterinarian surgeries
- Further developed a passion for research in cognitive neuroscience

Peer Reviewed Articles

Kharlas, D. A., Frewen, P. A. and Brand, B. L. (2018 August). The Lived experience of Dissociation and Its Treatment: Thematic Analysis of TOP DD Network Participant Feedback. San Francisco, California, United States. (Submitted to journal pending review).

Kharlas, D. A., Frewen, P. A. (2016). Trait mindfulness correlates with individual differences in multisensory imagery vividness. *Personality and Individual Differences. 101,* 489-489, doi:10.1016/j.paid.2015.09.027

Boughner, E. N., Thornley, E. A, **Kharlas, D. A**., & Frewen, P. A. (2016). Mindfulness-related traits partially mediate the association between lifetime and childhood trauma exposure and PTSD and dissociative symptoms in a community sample assessed online. *Mindfulness*. 7(3), 672-679. doi:10.1007/s12671-016-0502-3

Kharlas, D. "Effects of Caffeine in Operant Learning and Locomotor Activity" (2015). *2015 Undergraduate Awards.* Paper 4. http://ir.lib.uwo.ca/ungradawards_2015/4

Conference Talks

Kharlas, D. A., Frewen, P. A. and Brand, B. L. (2016 April). The Lived experience of Dissociation and Its Treatment: Thematic Analysis of TOP DD Network Participant Feedback. San Francisco, California, United States.

Kharlas, D. A. (2015 November). Effects of Caffeine in Operant Learning and Locomotor Activity. Dublin, Ireland.

Kharlas, D. A. (2016 March). Comparing Objective and Subjective Measurements of Imagery and Trait Mindfulness. London, Ontario.

Conference Posters

Kharlas, D., Chung, T., and Bradley, D. (2014 June). Posttraumatic Nightmares. *Canadian Psychological Association*, Fact Sheet. 2015. Ottawa, Canada.

Kharlas, D. A., Frewen, P. A. (2015 June). Trait mindful observing correlates with individual differences in multisensory imagery vividness. Schulich Department of Psychiatry Research Day, Poster Presentation. London, Canada.

Kharlas, D. A., Frewen, P. A. (2015 July). Trait mindful observing correlates with individual differences in multisensory imagery vividness. International Society for the Study of Individual Differences 2015, Poster Presentation. London, Canada.

Awards and Grants

RBC Collaborative Community Project Grant Recipient $1004 for EAT tool to be applied at Merrymount Family Support and Crisis Centre

Highly Commended Entrant in Global Summit Undergraduate awards 2015 in Dublin, Ireland

Extra-Curricular Activities and Volunteer Experience

- London Mindfulness Community 2017-present
  Director and meditation facilitator
- Scinapse organizes the Undergraduate Science Case Competition 2013-2016
  Director and founder at Scinapse Scientific Education
- Merrymount Family Support and Crisis Centre 2014-2016
  Collaborated with organization to create an effective tool for families to be able to cook in cost and time effective ways
- Western Undergraduate Neuroscience Society 2013-2015
  Collaborator