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# THE SECULAR PRACTICE OF A SPIRITUAL TECHNIQUE: MINDFULNESS-BASED INTERVENTIONS AND SPIRITUALITY

Samuel D. Landau

## **Section A:**

Finding the spiritual in the secular: a meta-analytic and narrative review  
of changes in spirituality following a secular mindfulness-based  
intervention

7974 words (+558)

## **Section B:**

The 'myth' of mindfulness-based interventions: a randomised  
comparison of the effect of secular vs spiritual role-inductions on  
credibility and outcomes

7937 words (+731)

Overall word count: 15911 (+1289) words

A thesis submitted in partial fulfilment of the requirements of  
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SALOMONS CENTRE FOR APPLIED PSYCHOLOGY  
CANTERBURY CHRIST CHURCH UNIVERSITY

**CANTERBURY CHRIST CHURCH UNIVERSITY**  
**Doctorate in Clinical Psychology (D.Clin.Psychol.)**

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Major Research Project

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## Summary of the Major Research Project

Section A used systematic search, meta-analysis and narrative review to determine (i) if secular mindfulness-based interventions (MBIs) increase spirituality, and (ii) whether the evidence indicated possible mediating or moderating effects of spirituality on outcomes. It found that in general secular MBIs do increase levels of self-reported spirituality, with increases maintained at follow-up. Evidence for the moderating role of spirituality was not found, with mixed mediation results depending on the proposed model. These findings led to the proposal of a more comprehensive mediation model, considering issues of multi-directional causality among the constructs of MBI, mindfulness, spirituality and wellbeing outcomes.

Section B investigated MBIs through the prism of Common Factors approaches, specifically focusing on the work of Jerome Frank and the concept of a healing 'myth' or story. MBIs tell a broad 'myth', incorporating both spiritual and secular elements. An online randomised control trial was employed to determine if a broad philosophically-integrated 'myth' of MM was more effective at improving credibility and expectations, state mindfulness and affect, compared to narrower spiritual or secular 'myths'. Congruency effects between participants' disposition and group allocation were also tested. While all groups showed significant improvements on measures, the integrated group did not improve more than the secular or spiritual groups, with limited congruency effects. Results are discussed in the context of a possible dominant 'myth' of MBIs that overrides secular/spiritual divisions; finding peace in a frantic world.

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## **SECTION A**

Samuel D. Landau

**Finding the spiritual in the secular: a meta-analytic and narrative  
review of changes in spirituality following a secular mindfulness-  
based intervention**

7974 words (+558)

SALOMONS CENTRE FOR APPLIED PSYCHOLOGY  
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## **Abstract**

Mindfulness meditation (MM) is an ancient Buddhist spiritual practice that has been secularised into increasingly popular mindfulness-based interventions (MBIs). While there are numerous reviews that link both MBIs to wellbeing and spirituality to wellbeing, to the best of our knowledge there is no systematic review investigating the link between MBIs and spirituality. The purpose of this review was to use systematic search, meta-analysis and narrative review to determine (i) if secular MBIs increase spirituality, and (ii) whether there is evidence to indicate possible mediating or moderating effects of spirituality on outcomes. Thirty quantitative studies of MBIs and their effects on spirituality met eligibility criteria following systematic search of the literature. The meta-analysis and narrative review found that in general, secular MBIs do increase levels of self-reported spirituality, with increases maintained at follow-up. Evidence for the moderating role of spirituality was not found, but depending on the mediation model under investigation, increases in spirituality were found to be mediated by increases in mindfulness and decreases in trait anxiety. Conversely, increases in spirituality were also found to operate in the opposite direction; improving psychological wellbeing via mindfulness as mediator. These findings led to the proposal of a more comprehensive mediation model, considering issues of multi-directional causality among the constructs of MBI, mindfulness, spirituality and wellbeing outcomes.

### **Keywords:**

Mindfulness; Meditation; Spirituality; Meta-analysis; Mediation

## Introduction

Mindfulness meditation (MM) has seen a veritable explosion in its therapeutic application and scientific examination (Crane et al., 2017; Williams & Kabat-Zinn, 2011). Mindfulness-based interventions (MBIs) are increasing in their popularity while publications on the topic of mindfulness continue to expand (e.g. Baer, 2003; Khoury et al., 2013). 'Mindfulness' may refer to a psychological trait, a state of awareness, a practice of cultivating mindfulness (e.g. MM), or a psychological process (Germer, Siegel, & Fulton, 2005). For clarity, the intended meanings of 'mindfulness' will be explained throughout this review (Chambers, Gullone, & Allen, 2009), though the focus of the review will be on the effects of MM via MBIs. One of the most commonly cited definitions of mindfulness is the awareness that arises through "paying attention in a particular way: on purpose, in the present moment, and nonjudgmentally" (Kabat-Zinn, 1994, p. 4). Descriptions of mindfulness provided by most other researchers are similar (Keng, Smoski, & Robins, 2011). Numerous empirical studies and reviews chart the broad array of positive outcomes that arise from MBIs, both psychological (e.g. Khoury et al., 2013) and physiological (e.g. Carlson, 2012), though effect sizes were smaller when compared to other active interventions (Khoury et al., 2013).

MM originates from a 2550-year-old Buddhist spiritual tradition (Bhikkhu, 1979; Williams & Kabat-Zinn, 2011). The secularisation and application of MM as an intervention for clinical problems was popularised via the work of Jon Kabat-Zinn who used MM to help people experiencing chronic pain (Kabat-Zinn, 1982) in a programme now known as Mindfulness-Based Stress Reduction (MBSR). Since the establishment of MBSR, several other MBIs have been developed, such as

Mindfulness-Based Cognitive Therapy (MBCT; Segal, Williams, & Teasdale, 2002) and Mindfulness-Based Cancer Recovery, an adaptation of MBSR to cancer populations (MBCR; Carlson & Speca, 2010). MBIs are defined as being 'informed by theories and practices that draw from a confluence of contemplative traditions, science, and the major disciplines of medicine, psychology and education...[and] draw on aspects of these (contemplative) traditions while leaving behind their religious, esoteric and mystical elements' (Crane et al., 2017). While other interventions utilise techniques that might be described as 'mindfulness-orientated' but not 'meditation-orientated' (Keng et al., 2011), e.g. dialectical behaviour therapy (DBT; Linehan, 1993) and acceptance and commitment therapy (ACT; Hayes, Strosahl, & Wilson, 1999), this review will only consider secularised MM-based interventions.

Researchers have begun to consider mindfulness-specific mechanisms to explain the positive outcomes of MBIs. Shapiro, Carlson, Astin and Freedman (2006) proposed a process of 'reperceiving' as a meta-mechanism by which MM achieves positive change. Others have suggested four mechanisms of MM; namely attention regulation, body awareness, emotional regulation, and change in perspective on the self (Hölzel et al., 2011). However, the role of spirituality in explaining the outcomes of MBIs has only relatively recently been given significant empirical consideration (e.g. Carmody, Reed, Kristellar & Merriam, 2008).

While there is a considerable literature that connects religiosity and spirituality to positive health outcomes (e.g. Pargament, 1997; Hill & Pargament, 2003; Miller & Thoreson, 2003; Koenig, 2009), it is more difficult to find a consistent operationalised definition of these constructs. A variety of definitions are held by scholars, lay-people and psychologists (Zinnbauer, Pargament & Scott, 1999). Examples of these

divergent definitions of religiosity include reference to the concrete, e.g. in the form of faith-based practices (Doyle, 1992), the abstract, e.g. as an altered state of consciousness (Jung, 1938), and the metaphysical e.g. a search for purpose and meaning in God / a Higher Power (Rahner & Vorgrimler, 1981). Likewise, spirituality has been defined by reference to a relationship with God / a Higher Power that affects one's behaviour (Armstrong, 1995), an inner need for self-transcendence and finding oneself (Benner, 1989), an existential search for meaning (Doyle, 1992) and a set of prescriptive spiritual practices, such as prayer devotions (O'Collins & Farrugia, 1991). A similar plurality of definitions is found when studying language (e.g. Zinnbauer et al., 1997), asking clergy and lay-people (Zinnbauer, 1997), and even after applying content analysis to definitions of these constructs used in social sciences (Scott, 1997). Moreover, there has been a more recent trend to define religiosity and spirituality as distinct constructs, such that someone might be religious but not spiritual, and vice versa (Zinnbauer et al., 1999).

Nevertheless, a scientific consensus regarding operational definitions of spirituality and religiosity has been found on one level; these are complex constructs (e.g. Larson, Swyers, & McCullough, 1998; Pargament, 1997). Spirituality is neither dichotomous (a quality that is either present or absent) nor a single linear dimension (a quality that one has more or less of). Rather, spirituality and religiosity can be conceptualised as multidimensional latent constructs, that is, conceptual underlying entities that are not observed directly but can be inferred from observations of some of their component dimensions (Miller & Thoresen, 2003).

Based upon this premise of spirituality and religiosity being multi-dimensional latent variables, this project will use definitions based on the following influential accounts in the social sciences literature. Religiosity can be understood as the

formal, institutional, and public manifestation of the sacred (Miller & Thoreson, 2003), measured by such observable and self-report variables as importance of religion, belief in God, frequency of religious service attendance/prayer (Cotton et al., 2006). Spirituality can be defined as the internal, personal, and private manifestation of the sacred (Hill & Pargament, 2003), measured primarily by self-report variables, such as spiritual well-being, peace and comfort derived from faith, spiritual connectedness, and spiritual coping (Cotton et al., 2006).

MM, even in a secularised MBI, may achieve positive outcomes, not just through mindfulness-specific mechanisms, but also by increasing spirituality; as noted above, increased spirituality is associated with improvements in wellbeing (e.g. Koenig, 2009)). Indeed, spiritual engagement has been suggested as a fundamental change mechanism in MBIs (Kristeller, 2010). While there are numerous systematic reviews that link both MM to wellbeing and spirituality to wellbeing, to the best of the author's knowledge there is no systematic review that considers the link between MBIs and spirituality.

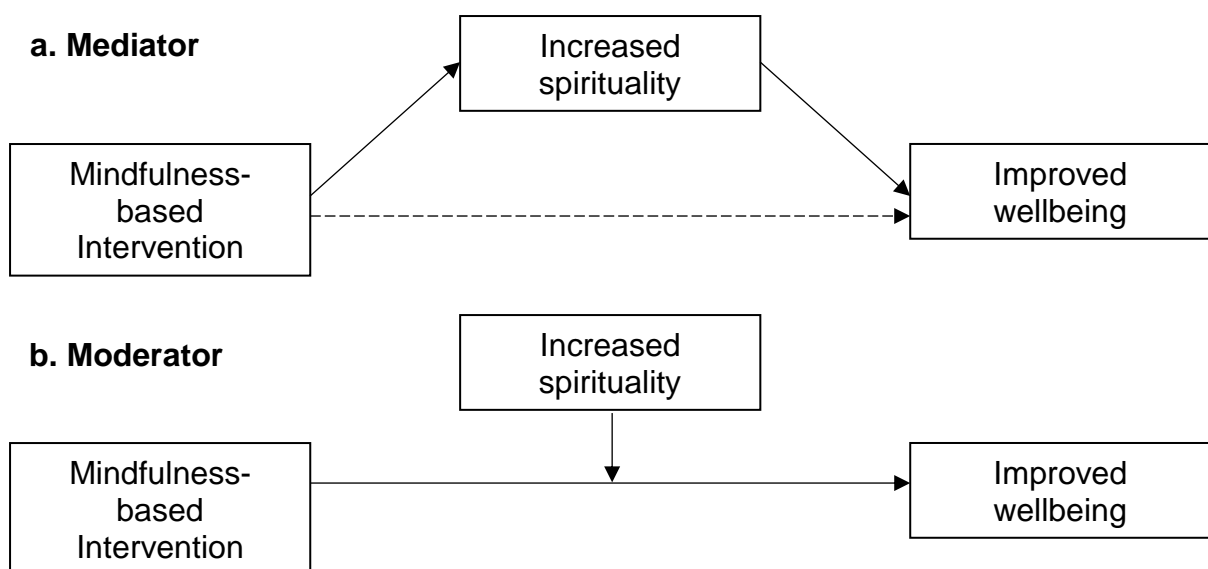
Theoretically, we might expect MBIs and their associated MM training to increase spirituality as MM allows people to more easily shift their 'view' between the "foreground and background of experience" (Greeson et al., 2011) such that awareness and experiences of spirituality may become more noticeable (see Discussion for further consideration). In turn, greater spiritual / religious experiences have been suggested to improve wellbeing by changing health practices, offering social support, improving psychosocial resources, and supporting helpful belief structures such as sense of coherence (George, Ellison, & Larson, 2009), though these factors alone are not sufficient to explain the range of benefits of religion / spirituality (George et al., 2009). The possible improvements to wellbeing from



enhancing spirituality via MBIs are therefore of clinical interest. Moreover, spirituality has historically been an oft-neglected aspect of people’s lives within a healthcare context, with arguments to incorporate spirituality into the biopsychosocial model (Sulmasy, 2002). As such, considering spirituality within interventions is of important clinical relevance; particularly MBIs that are based upon spiritual teachings albeit in a secularised context (Williams & Kabat-Zinn, 2011), and are often delivered to people experiencing existential crises, such as those suffering cancer (e.g. Carlson et al., 2016). A better understanding of the mechanisms and moderators of MBIs may help improve interventions by developing the efficacy of ‘active ingredients’ as well as deploying them appropriately to people most likely to benefit from them.

The purpose of this review was to use systematic search, meta-analysis and narrative review to address two questions:

- i) do secular MBIs increase spirituality?
- ii) if so, are increases in spirituality a mechanism / mediator (Figure 1a) by which MBIs achieve positive outcomes, or a moderator (Figure 1b) of the effects of MBIs?



**Figure 1.** To display possible effects of increased spirituality as either: a) a mediator (i.e. accounts for the relation between the predictor and the outcome; explains how or why effects occur), or b) a moderator of positive outcomes (i.e. affects the strength of the relation between the predictor and outcome; explains when certain effects will hold) (see Baron & Kenny, 1986), following a MBI.

It was intended to answer the first question primarily by meta-analysis, literature allowing. This would be supplemented by narrative review to consider the studies not included in the meta-analysis and any nuances in the findings using a levels of evidence framework for quantitative research on intervention studies (see Table 1), as has been used in other reviews of MBIs (see Carlson, 2012). The second question would be addressed solely by narrative review.

**Table 1**

Levels of evidence framework (reproduced from Carlson, 2012; based upon National Health and Medical Research Council of Australia (Merlin et al., 2009)).

<b>Level</b>	<b>Description</b>
1	Systematic review/meta-analysis of RCTs
2	Randomized controlled trial (using usual care, waitlist, or active control group)
3.1	Pseudorandomized Controlled Trial (i.e., alternate allocation or some other method)
3.2	Comparative study with concurrent controls (e.g., nonrandomized experimental trial; cohort study; case-control study; interrupted time series with a control group)
3.3	Comparative study without concurrent controls (e.g., historical control study; two or more single arm study; interrupted time series without a parallel control group)
4	Case series / pretest, posttest

## **Method**

### **Eligibility criteria**

Articles were included if they were:

- 1) empirical intervention studies
- 2) of a secular MBI

that included a psychometrically validated measure of spirituality as an outcome variable. It was decided not to include interventions that explicitly contain spiritual components as well as MM components (e.g. Spiritual Self-Schema Therapy; Avants and Margolin, 2004) to ensure that any change in spirituality was due to the MBI alone. We also excluded correlational studies between trait / state mindfulness and spirituality, instead focusing on the change effects of a MBI, given that the latter support stronger conclusions about causation. Papers were excluded if they were opinion pieces / selective reviews as opposed to empirical work, or if they conflated meditation and spirituality (e.g. considering prayer to be a meditative technique). Search engine limits were set in order that the retrieved articles were in English language and published in peer-reviewed journals. Reference lists of relevant articles were hand-searched to ensure that expected studies were included within the results of the search terms.

### **Search strategy**

Searches took place during March 2017 and covered all records in the databases till this time. PsychInfo and Medline databases were searched using the terms '(meditation OR mindfulness OR mbsr OR mbct OR medita\* OR mindful\*) AND (spirituality OR religiosity OR religion OR spirit\* OR relig\* OR Buddhism)', searching abstracts, titles and keywords.

## **Study selection**

Duplicate studies from the databases were removed. Titles and abstracts of articles were screened with regards to whether they met the eligibility criteria by the author. Those studies that clearly did not were excluded at this stage. Remaining full-text papers were then screened and ineligible papers removed. Any areas of uncertainty were discussed with the author's supervisor.

## **Data extraction and sub-grouping**

### **Meta-analysis of controlled trials of MBIs.**

For the controlled trials of MBIs, the number of participants, and post-intervention means and standard deviations for the spirituality outcome measures were extracted, for both control and MBI groups. Follow-up data was extracted if available. Studies were coded based on whether they had an active or passive control (as effect sizes for active controls have been shown to be smaller than for passive ones; Khoury et al., 2013) and whether they used a cancer patient population or not. People who have experienced cancer may have a greater interest in existential / spiritual issues (Tacon, 2011), owing to the perception of cancer's strong association with eventual death (Strang, 1997). Therefore, cancer populations may respond differently to MBIs, owing to their lived experience of 'existential plight' (Weisman & Worden, 1977), affecting generalisability from this sub-group.

As the meta-analysis was performed separately for studies with active and passive controls, those studies that contained both controls were included in both meta-analyses. One study contained two active MBI conditions, a standard secularised as well as a novel spiritualised MBI, in addition to an active non-MM

control (Feuille & Pargament, 2015). As this study did employ a secularised MBI it was included in the meta-analysis, using the non-MM control as a comparator. Corresponding authors of studies with unreported data that was required for the meta-analysis were contacted to request the data and given two weeks to respond until these studies were excluded.

### **Narrative review.**

All studies were narratively reviewed to consider studies not included in the meta-analysis, nuances in findings, as well as any mediation or moderation analyses. Additional information about the studies, including participant characteristics, type of intervention, intervention length and outcome measures used, was extracted. Studies were coded based on the levels of evidence framework (see Table 1; Carlson, 2012).

### **Risk of bias in studies**

The quality of the studies included in the meta-analysis was assessed using Jadad's (1996) guidelines. Jadad guidelines assess methodological quality according to the presence or absence of five criteria, with particular focus on appropriate randomisation, double-blinding and description of withdrawals. One point was allocated for each Jadad criterion, giving a total score ranging from 0 to 5, with higher scores indicating higher quality. Spearman's correlation between Jadad ratings and effect sizes was calculated to determine whether study quality was associated with the size of outcomes observed.

## Meta-analysis of controlled trials

To compare post-intervention spirituality scores between intervention (1) and control (2) groups, the number of participants per group ( $n_1$  and  $n_2$ ), post-intervention means ( $m_1$  and  $m_2$ ), and standard deviations ( $sd_1$  and  $sd_2$ ), were entered into Review Manager (RevMan) version 5.3 (Cochrane Collaboration, 2014). Standardised between group effect sizes (SMDs) were calculated by RevMan employing the formulae:  $SMD = (m_1 - m_2) / S \sqrt{1 - 3 / (4N - 9)}$  where  $S = \sqrt{[(n_1 - 1)(sd_1^2) + (n_2 - 1)(sd_2^2)] / (N - 2)}$  and  $N = n_1 + n_2$

The estimated pool effect and its confidence interval were calculated using a random effects model, given the heterogeneity in the included MBIs. RevMan produced a forest plot of findings, which included a chi-squared test to measure heterogeneity of effect sizes (Sin & Lyubomirsky, 2009). Separate analyses of active and passive controlled intervention studies were performed with sub-group analyses of cancer vs non-cancer populations within the passive set (there were insufficient active controlled studies to perform further sub-group analyses). Funnel plots were used to examine for publication bias.

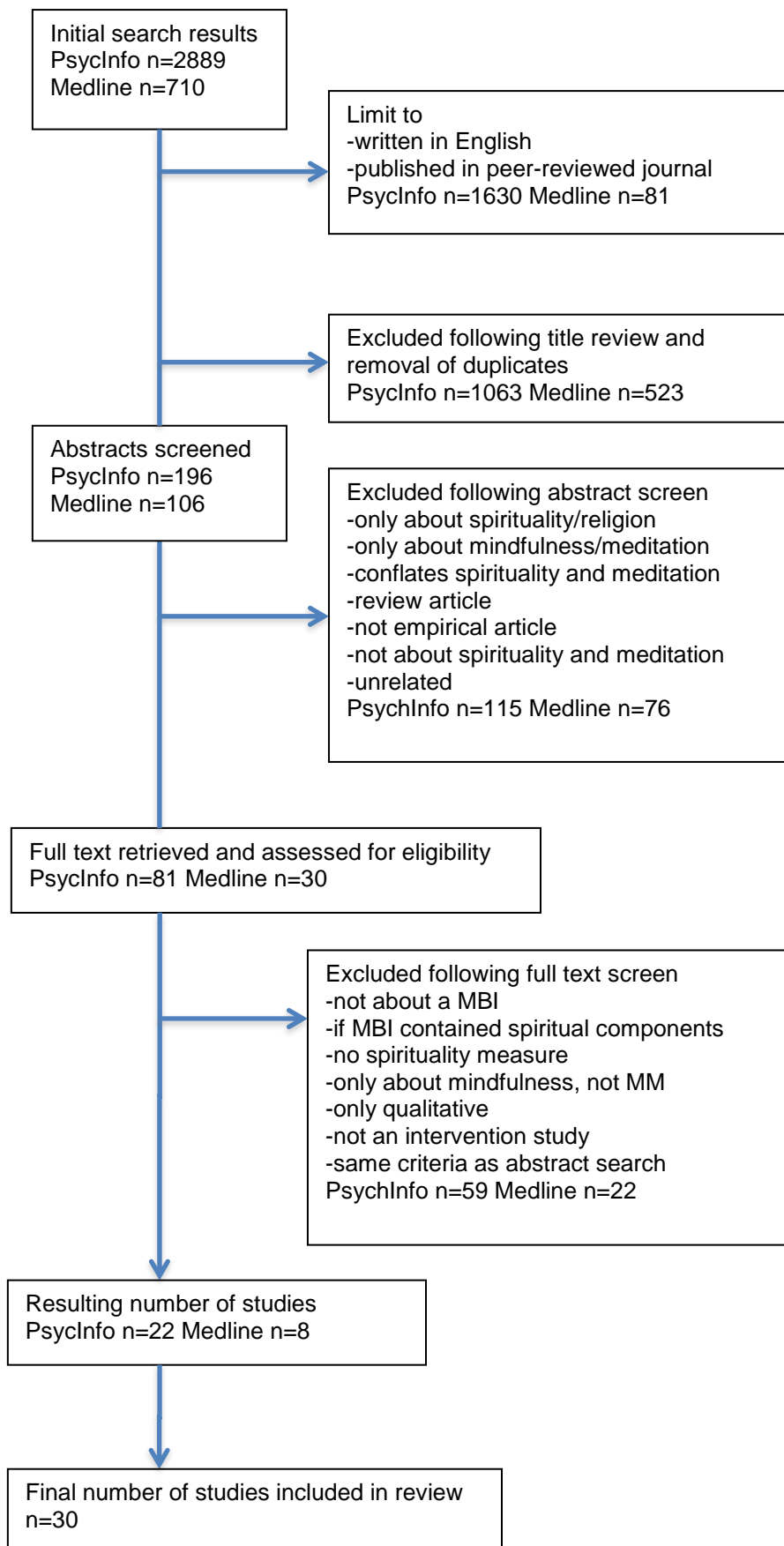
## Results

Figure 2 illustrates the search process (based on PRISMA; Moher, Liberati, Tetzlaff & Altman, 2009). Thirty studies met the inclusion criteria: the number of studies per the levels of evidence framework (Carlson, 2012) is displayed in Table 2. A summary of all the studies included in the review is displayed in Table 3, this table includes details of study arms and Jadad (1996) quality ratings for those studies included in the meta-analysis below.

**Table 2**

Number of studies resulting from the systematic search per the levels of evidence criteria (Carlson, 2012).

<b>Level</b>	<b>Description</b>	<b>Number of studies</b>
1	Systematic review/meta-analysis of RCTs	0
2	Randomized controlled trial	10
3.1	Pseudorandomized Controlled Trial	2
3.2	Comparative study with concurrent controls	4
3.3	Comparative study without concurrent controls	0
4	Case series/pretest, posttest	14



**Figure 2.** Illustration of systematic search process based on PRISMA (Moher et al., 2009).



**Table 3**

Summary table of all studies included in review, including details of study arms and Jadad (1996) quality ratings for those studies included in the meta-analysis below.

<b>Study authors, year of publication, country where study took place</b>	<b>Participants</b>	<b>Cancer / non-cancer</b>	<b>MBI</b>	<b>Level of evidence, Design (including details of control arms), Jadad rating</b>	<b>Spirituality measure and when taken.</b>	<b>Key findings regarding spirituality</b>
Astin. (1997), USA	n=19, 1 man, 18 women, volunteer undergraduate students in Behavioural Medicine class.	Non-cancer	Stress Reduction and Relaxation Programme (early form of MBSR), 8 weekly 2hr group sessions.	Level 2: RCT with waitlist control.	Index of Core Spiritual Experiences (INSPIRIT). Pre- and post-intervention.	INSPIRIT scores increased significantly (albeit minimally) from pre- to post-intervention, though with no reference to controls. Higher INSPIRIT scores did not correlate with decreased symptomology.

Carlson et al. (2016), Canada	n=252, mean age MBI group = 55.12, SD = 9.84, mean age active control = 54.14, SD = 10.23, all significantly distressed women with a diagnosis of breast cancer, either referred by medical staff or self.	Cancer	MBCR programme (adapted from MBSR), 8 weekly 1.5hr group sessions, additional 6hr retreat.	Level 2: RCT, with active control Supportive Expressive Group Therapy (SET), 12 weekly 1.5hr group sessions (same contact time as MBCR). 1-day stress management seminar (minimal control). <b>Jadad: 5</b>	Functional Assessment of Chronic Illness Therapy – Spiritual Well-being (FACIT-sp). Pre-, post-, 6 months, and 12 months following intervention.	FACIT-sp scores improved more from pre- to post-intervention for MBI group compared to active control, with small to medium effect size (d=0.27), that were maintained at follow-up.
Carson, Carson, Gil, & Baucom. (2004), USA	n=88, non-distressed heterosexual couples cohabiting for at least 12 months who did not regularly practice meditation/yoga.	Non-cancer	Mindfulness-Based Relationship Enhancement (adapted form of MBSR for couples), 8 weekly 2.5hr group sessions, additional 7hr retreat.	Level 2: RCT with passive waitlist control. <b>Jadad: 2</b>	Index of Core Spiritual Experiences (INSPIRIT). Pre-, post- and 3-months following intervention.	INSPIRIT scores increased significantly pre- to post-intervention and were maintained at follow-up.

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Henderson et al. (2012), USA	n=163, mean age = 49.8, SD = 8.4. All women diagnosed within past 2 years with early-stage breast cancer.	Cancer	MBSR programme, 8 weekly 2.5hr-3.5hr group sessions, additional 7.5hr retreat, 3 monthly 2hr top-up sessions following programme completion.	Level 2: RCT with active (nutrition education programme – NEP, group intervention matched in time duration to MBI) and passive TAU control groups. <b>Jadad: 3</b>	Extended spirituality subscale of Functional Assessment of Cancer Therapy, breast cancer version (FACT-B). Pre-, post- and 12 months following intervention.	Spirituality scores on FACT-B showed significantly greater increases for MBI group compared to controls, both at post-intervention and 12-month follow up. No other outcome measure maintained significance for the MBI group at 12-month follow.
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Jain et al. (2007), USA	n=83, 16 men, 67 women. Mean age = 25, range 18-61. Medical, nursing and pre-medical/health students, reporting distress.	Non-cancer	Intervention modelled on MBSR. 4 weekly 1.5hr group sessions with additional 6hr retreat.	Level 2: RCT with both active (somatic relaxation, 1-month long intervention, one 1.5hr class per week with additional 6hr retreat) and passive waitlist controls. <b>Jadad: 3</b>	Index of Core Spiritual Experiences – revised (INSPIRIT-R). Pre- and post-intervention.	No significant group differences on the INSPIRIT-R at post-intervention or in change from pre- to post-intervention were found.
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Oman et al. (2007), USA	n=44, mean age not provided, range 18-24, 9 men, 35 women, recruited from undergraduates at an American Roman Catholic university.	Non-cancer	MBSR programme, 8 weekly 1.5hr group sessions.	Level 2: RCT with additional intervention (passage meditation (PM) – spiritually based intervention) and passive (waitlist) control.	Positive and negative forms of religious coping subscales of the Brief Multidimensional Measure of Religiousness/Spirituality (BMMRS); Images of God measure; Spiritual Modelling Inventory of Life Environments (SMILE), pre-, post- and 8 weeks following intervention.	Both MBI and PM decreased negative religious coping and images of God as mainly controlling, compared to control, without statistically differing in their effects. No changes found in positive religious coping or positive God images. PM group showed greater improvements on a number of other spiritual measures compared to MBI.
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Shapiro, Schwartz, & Bonner. (1998), USA	n=78, (no age or gender demographics provided). Premedical and medical students.	Non-cancer	Stress Reduction and Relaxation Programme (early form of MBSR), 7 weekly 2.5hr group sessions.	Level 2: RCT, with matched randomization using passive waitlist control. <b>Jadad: 2</b>	Index of Core Spiritual Experiences (INSPIRIT). Pre- and post-intervention.	INSPIRIT scores for MBI group increased significantly more than control pre- to post-intervention. Hierarchical multiple regressions indicated that decreases in depression and state anxiety resulted in increases in spirituality.
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Wurtzen et al. (2015), Denmark	n=336, mean age at diagnosis = 54.1, SD = 10.3. All women, operated for breast cancer and had received diagnosis 3-18 months prior to study.	Cancer	MBSR, 8 weekly 2hr group sessions, additional 5hr retreat.	Level 2: RCT with usual care control.	Functional Assessment of Chronic Illness Therapy – Spiritual Well-being (FACIT-sp). Pre-, post-, 6 months and 12 months following intervention.	Significantly greater increases in FACIT-sp scores of MBI group compared to control at post- and 6-months following intervention, but significant group differences not maintained at 12-month follow-up.
Zernicke et al. (2013), Canada	n=90, mean age = 45, range 18-77, 9 men, 81 women. Adults that had a diagnosis of IBS per standard Rome III criteria, without prior participation in MBSR, recruited from multiple gastroenterologists' offices.	Non-cancer (but with chronic physical illness)	MBSR, 8 weekly 1.5hr group sessions, additional 3hr workshop.	Level 2: RCT with passive waitlist control. <b>Jadad: 3</b>	Functional Assessment of Chronic Illness Therapy – Spiritual Well-being (FACIT-sp). Pre-, post- and 6 months following intervention.	Both intervention and control groups showed significant improvements on FACIT-sp, no significant between group differences.

Zernicke et al. (2014), Canada	n=62, 17 men, 45 women. Mean age = 57.56, SD = 10.79, Distressed adult cancer survivors without access to MM services.	Cancer	Online MBCR, 8 weekly 2-hr sessions, additional 6 hr retreat.	Level 2: RCT with passive waitlist control. <b>Jadad: 3</b>	Functional Assessment of Chronic Illness Therapy – Spiritual Well-being (FACIT-sp). Pre- and post- intervention.	FACIT-sp scores for MBI group increased significantly more than control pre- to post-intervention but with small effect size (d = 0.37). Some spirituality items increased significantly in SPM group compared to control but only borderline significance compared to STM. STM and SPM groups similar in pain-related outcomes. SPM resulted in increased state mindfulness compared to STM.
Feuille & Pargament, (2015), USA	n=74, mean age = 19.9, SD = 3.5, 13 men, 59 women. Participants recruited from university and community, required to be migraineurs.	Non-cancer	Secularised (STM) and spiritualised (SPM) mindfulness one-off training session (7 mins), with instructions for 20 mins practice per day for following 2 weeks.	Level 3.1: quasi-RCT, two intervention groups (STM and SPM) and an active control (simple relaxation). <b>Jadad: 1</b>	Selected items from Brief Multidimensional Measure of Religiousness/Spirituality (BMMRS). Pre- and post-intervention.	



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Mawani, Rashid, Verrier, & Dick. (2014), Canada	MBI group: n=29, mean age = 44.7, SD = 13.2, 9 men, 20 women. Control group: n=25, age = 46.2, SD = 12.1, 4 men, 21 women. All patients referred to pain treatment centre for chronic non-cancer pain.	Non-cancer (but chronic pain)	Adaptation of CBT group pain management programme to include MM, 8 weekly sessions.	Level 3.1: quasi-RCT, TAU CBT group pain management programme as active control. Alternate allocation to conditions	Spiritual Assessment Scale (SAS). Pre- and post- intervention.	SAS scores showed no significant post-intervention differences between MBI and control groups. Change scores on SAS significantly correlated with McGill Pain Questionnaire change scores. Spirituality accounted for 23% of the variance in changes in evaluative aspects of pain.
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Crescentini, Urgesi, Campanella, Eleopra, & Fabbro. (2014), Italy	n=30, experimental group n=15, mean age = 44.53, SD = 9.43, 3 men, 12 women. control group n=15, mean age = 37.53, SD = 11.29, 9 men, 6 women. Italian sample recruited via convenience sampling.	Non-cancer	Mindfulness-oriented meditation training (MOM), 8 weekly 2hr group sessions.	Level 3.2: Non-randomised trial with matched passive waitlist control. <b>Jadad: 1</b>	Implicit Association Test for religious / spiritual dimensions (RS-IAT); Self-transcendence scale of the Temperament and Character Inventory (TCI); Index of Core Spiritual Experiences (INSPIRIT). Pre- and post- intervention, all presented in Italian.	Significant increases in explicit measures (TCI and INSPIRIT) across participants, as well as increases in implicit measures (RS-IAT) for those with low pre-existing RS-IAT, compared to controls.
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Garland, Carlson, Cook, Lansdell, & Speca. (2007), Canada	MBI group: n=60, mean age = 52.17, range 26-78, 6 men, 54 women. Control group: n=44, mean age = 52.84, range 35-79, 3 men, 41 women. All were self-selected patients who had been diagnosed with cancer.	Cancer	MBSR, 8 weekly 1.5hr group sessions, additional 3hr retreat.	Level 3.2: Longitudinal cohort comparison of MBI with active control, Healing through the creative Arts – HA: 6 weekly 2hr group sessions.. Participants self-selected condition. <b>Jadad: 0</b>	Functional Assessment of Chronic Illness Therapy – Spiritual Well-being (FACIT-sp). Pre- and post- intervention.	Time by group interaction found for FACIT-sp such that MBI group scores increased while HA group scores were constant. Increases in spirituality were associated with decreases in stress and mood disturbance.
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Geary & Rosenthal. (2011), USA	<p>MBI group: (n=59), mean age = 48, SD = 9.6, 80% women. Employees at university medical branch that had participated in MBSR course.</p> <p>Control group (n=49), mean age = 42, SD = 8.7, 96% women).</p> <p>Employees from NICUs (also stressed individuals at academic health care institute).</p>	Non-cancer	MBSR, 8 weekly 3hr group sessions, additional 8hr retreat.	<p>Level 3.2: Longitudinal cohort study with non-intervention passive control, anecdotally matched on levels of workplace context and stress.</p> <p><b>Jadad: 0</b></p>	Daily Spiritual Experiences Scale (DSES). Pre-, post- and 12-months following intervention.	DSES scores for MBI group significantly improved from pre- to post-intervention and this was maintained at 12-month follow up. No significant changes in control group scores.
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Labelle, Lawlor-Savage, Campbell, Faris, & Carlson. (2015), Canada	n=211, mean age = 52.7, SD = 11.0, 80.1% women. Adults who had received diagnosis of cancer, most (70.1%) not receiving primary cancer treatment during MBI, recruited from patients who had signed up to MBI.	Cancer	MBCR programme (adapted from MBSR), 8 weekly 1.5hr group sessions, additional 6hr retreat.	Level 3.2: Longitudinal cohort study with passive waitlist control. <b>Jadad: 1</b>	Functional Assessment of Chronic Illness Therapy – Spiritual Well-being (FACIT-sp). Pre-, mid- and post- intervention.	FACIT-sp scores for MBI group increased significantly more than control pre- to post-intervention. Increased self-reported mindfulness (FFMQ), on all facets, mediated the association between MBI participation and enhanced spirituality.
Ando, Kira, Hayashida, & Ito. (2016), Japan	n=10, mean age = 56, range 37-73, all women. Patients with advanced cancer in Japanese hospital.	Cancer	Mindfulness Art Therapy, short version, two 1 hr individual sessions.	Level 4: Case series, pre- and post-intervention, no control.	Japanese version of Functional Assessment of Chronic Illness Therapy – Spiritual Well-being (FACIT-sp). Pre- and post- intervention.	No significant change in FACIT-sp scores from pre- to post-intervention.

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Birnie, Speca, & Carlson. (2009), Canada	n=51, mean age = 47.4, SD = 10.87, 16 men, 35 women, recruited from people attending publicly offered MBSR programme, free from chronic medical condition.	Non-cancer	MBSR programme, 8 weekly 1.5hr group sessions.	Level 4: Case series, pre- and post-intervention, no control.	Functional Assessment of Chronic Illness Therapy – Spiritual Well-being (FACIT-sp). Pre- and post- intervention.	FACIT-sp scores increased significantly pre- to post-intervention with medium effect size (d = 0.47). Changes in spirituality scores positively correlated with changes in self-compassion scores.
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Carlson et al. (2014), Canada	n=271, mean age MBI group = 54.66, SD = 9.71, mean age active control (53.62), SD = 10.11, mean age minimal control = 56.27, SD = 10.89. All significantly distressed women with a diagnosis of breast cancer, either referred by medical staff or self.	Cancer	MBCR programme (adapted from MBSR), 8 weekly 1.5hr group sessions, additional 6hr retreat.	Level 4: Secondary analysis of data from RCT, (see Carlson et al., 2016), resulting in this analysis being a pre- / post- intervention cases series, no control.	Functional Assessment of Chronic Illness Therapy – Spiritual Well-being (FACIT-sp). Pre-, post-, 6 months, and 12 months following intervention.	Moderator analyses revealed that a) there were no significant moderation effects of personality variables on spirituality scores, b) women who received their preferred intervention group showed greater increases in FACIT-sp scores compared to those who received their non-preferred group.
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Carmody, Reed, Kristeller, & Merriam. (2008), USA	n=44, mean age = 47.8, range 20-72, 11 men, 33 women, recruited from university medical school's self-pay MBSR programme, attended via health-care practitioner or self-referral.	Non-cancer	MBSR programme, 8 weekly 2.5hr group sessions, additional day retreat.	Level 4: Case series, pre- and post-intervention, no control.	Functional Assessment of Chronic Illness Therapy – Spiritual Well-being (FACIT-sp). Pre- and post-intervention.	FACIT-sp scores increased significantly pre- to post-intervention. Increases in state and trait mindfulness associated with increases in spirituality. Increases in spirituality (and trait mindfulness) associated with decreases in psychological and physiological symptoms.
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Dobos et al. (2015), Germany	n=117, mean age = 53.91, SD = 10.70, 11 men, 106 women. All cancer survivors referred to mindfulness-based day care clinic programme.	Cancer	Adaptation of MBSR to further integrate elements of mind-body medicine cancer programme. 11 weekly 6hr group sessions, semi-residential format.	Level 4: Case series, pre- and post-intervention, no control.	Spiritual and Religious Attitudes in Dealing with Illness Questionnaire (SpREUK – 15). Pre-, post- and 3-months following intervention.	All SpREUK subscales significantly increased following intervention.
Fish, Ettridge, Sharplin, Hancock, & Knott. (2014), Australia	n=26, mean age 56, SD = 11, 6 men, 20 women. Adults who were experiencing psychological distress as a result of a cancer diagnosis (as patient, survivor or carer).	Cancer	Mindfulness-Based Cancer Stress Management (MBCSM: modified from MBCT), 8 weekly 2hr group sessions, 3hr follow up session 6 weeks after completion.	Level 4: Case series, pre-, post- and 3-month following intervention, no control.	Functional Assessment of Chronic Illness Therapy – Spiritual Well-being, extended version (FACIT-sp-ex). Pre-, post- and 3-months following intervention.	FACIT-sp-ex scores increased significantly pre- to post- and 3-months following intervention. Mindfulness was significantly positively correlated with spirituality post-intervention and at 3-month follow-up.

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Flugel Colle et al. (2010), USA	n=16, mean age = 46.7, SD = 9.4, 2 men, 14 women. Participants recruited from local community and health clinic.	Not specific to cancer, 3 ppts. had cancer.	Intervention modelled on MBSR, 8 weekly evening sessions, additional day-long retreat.	Level 4: Case series, pre- and post-intervention, no control.	Single-item question on wellbeing battery assessing overall spiritual wellbeing. Pre- and post-intervention.	Spiritual wellbeing scores significantly increased following intervention.
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Greeson et al. (2015), USA	n=322, mean age = 45, SD = 12.2, 84 men, 238 women. Community-based sample from self-pay MBSR programme.	Non-cancer	MBSR programme, 8 weekly 2.5hr group sessions, additional 7hr retreat.	Level 4: Case series, pre- and post-intervention, no control.	Daily Spiritual Experiences Scale (DSES). Pre- and post-intervention.	Measures of spirituality, mindfulness and depressive symptoms all significantly improved following MBI. Baseline DSES not shown to moderate reduction in depressive symptoms. However, greater increases in DSES (and trait mindfulness) associated with greater reduction in depressive symptoms.
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Greeson et al. (2011), USA	n=279, 75% women, mean age = 45, SD = 11.6. Community-based sample from self-pay MBSR programme.	Non-cancer	MBSR programme, 8 weekly 2.5hr group sessions, additional 7hr retreat.	Level 4: Case series, pre- and post-intervention, no control.	Daily Spiritual Experiences Scale (DSES). Pre- and post-intervention.	Measures of spirituality, mindfulness and mental health all significantly improved following MBI. Structural equation modelling did not support full mediation of association between mindfulness and improved mental health via increased spiritual experiences, but partial mediation supported.
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Lengacher et al. (2010), USA	n=19, mean age = 56.8, SD = 8.8 years All women who had survived diagnosis of, and treatment for, breast cancer.	Cancer	Adaptation of MBSR for breast cancer survivors - MBSR(BC). 8 weekly 2hr group sessions.	Level 4: Case series, pre- and post-intervention, no control.	Two-item Likert-type scale assessing comfort derived from religion and religiosity.	Spirituality ratings did not significantly increase pre- to post-intervention.
Roberts & Montgomery. (2015), India	n=13, not all women certain of their age: 7 aged 18-25, 6 aged 26-35. All Indian village women with a history of stillbirth.	Non-cancer	Brief intervention modelled on MBSR, 2 lengthy sessions.	Level 4: Case series, pre- and post-intervention, no control.	Short form of the Brief Religious Coping Questionnaire (RCOPE). Pre- and post-intervention.	RCOPE scores did not significantly increase pre- to post-intervention.
Tacon. (2011), USA	n=65, mean age 45.4, range 32-63, all women. Participants had been diagnosed with breast cancer within 12-months of study, referred from oncologists' offices.	Cancer	MBSR, 8 weekly 1.5hr group sessions.	Level 4: Case series, pre- and post-intervention, no control.	Existential Wellbeing (EWB) subscale of Spiritual Wellbeing Scale. Pre- and post-intervention.	EWB scores increased significantly pre- to post-intervention.

Tamagawa, et al. (2015), Canada	n=38, mean age = 55.67, SD = 10.51, all significantly distressed women with a diagnosis of breast cancer, either referred by medical staff or self.	Cancer	MBCR programme (adapted from MBSR), 8 weekly 1.5hr group sessions, additional 6hr retreat.	Level 4: Secondary analysis of MBI group from RCT (see Carlson et al., 2016), resulting in this analysis being a pre- / post-intervention cases series, no control.	Functional Assessment of Chronic Illness Therapy – Spiritual Well-being (FACIT-sp). Pre- and post- intervention.	MBCR class attendance significantly correlated with increased FACIT-sp scores, and class attendance accounted for significant proportion (31.9%) of variance in FACIT-sp.
Zernicke et al. (2016), Canada	n=62, 17 men, 45 women. Mean age = 57.56, SD = 10.79, Distressed adult cancer survivors without access to MM services.	Cancer	Online MBCR, 8 weekly 2-hr sessions, additional 6 hr retreat.	Level 4: Secondary analysis of pooled data from RCT (Zernicke et al., 2014) (after waitlist had performed intervention), resulting in this analysis being a pre- / post-intervention cases series, no control.	Functional Assessment of Chronic Illness Therapy – Spiritual Well-being (FACIT-sp). Pre- and post- intervention.	FACIT-sp scores showed a time by age interaction such that greater increases in scores were found in younger participants compared to older participants.

## **Question 1: Do MBIs increase spirituality?**

The levels of evidence framework (Carlson, 2012) considers a systematic review/meta-analysis to be the highest level of evidence. Accordingly, this question was initially answered by producing a meta-analysis of controlled trials. Narrative review was used to consider remaining studies not included in the meta-analysis as well as any nuances in findings.

### **Meta-analysis of controlled trials**

Twelve studies with control groups (active or passive) had data available or provided by corresponding author for meta-analysis. The studies' arms and Jadad (1996) quality ratings are detailed in Table 3. The characteristics of the included studies will first be summarised, before the findings of the meta-analysis are presented.

### **MBIs employed**

The studies evaluated several different MBIs. Most of the studies (n=10) employed a form of MBSR (Kabat-Zinn, 1990), including a version adapted for cancer patients / survivors (MBCR; Carlson & Speca, 2010), as well as a form adapted for couples (Mindfulness-Based Relationship Enhancement (Carson, Carson, Gil, & Baucom, 2004). One study used Mindfulness-Oriented Mediation (MOM) (Crescentini, Urgesi, Campanella, Eleopra & Fabbro, 2014) based on a method suggested by Fabbro and Muratori (2012), informed by the Buddhist Theravada schools (Gunaratana, 2002) and Westernised MBIs such as MBSR. One study (Feuille & Pargament, 2015) used brief training to a MBI employing a mindfulness-of-breathing script used by Arch and Craske (2006).

Predominantly the MBIs were approximately eight weeks in duration with weekly group sessions lasting between 1.5-3.5 hours (n=9). Some MBIs included

longer retreats/workshops towards the end of the intervention (n=8). One study delivered the MBI online (Zernicke et al., 2014). One study offered weekly sessions over a month (Jain et al., 2007), and another offered a brief one-off introduction to MM with further instructions for home practice (Feuille & Pargament, 2015).

### **Spirituality measures used**

A variety of self-report spirituality measures were used. Five studies used the Functional Assessment of Chronic Illness Therapy-Spiritual Well-Being (FACIT-Sp) (Peterman, Fitchett, Brady, Hernandez, & Cella, 2002) with another (Henderson, et al., 2012) using the similar extended spirituality subscale of Functional Assessment of Cancer Therapy (FACT-B) (Cella et al., 1993). Three studies used the Index of Core Spiritual Experiences (INSPIRIT) (Kass, Friedman, Leserman, Zuttermeister, & Benson, 1991), with another (Jain et al., 2007) using a different form of the INSPIRIT; the INSPIRIT-R (Kass et al., 1991). One study (Feuille & Pargament, 2015) used items from the Brief Multidimensional Measure of Religiousness/Spirituality (BMMRS) (Fetzer, 1999), another (Geary & Rosenthal, 2011) used the Daily Spiritual Experience Scale (DSES) (Underwood & Teresi, 2002). While these measures differed in their construct of spirituality (see Discussion), they all reported good psychometric properties of validity and consistency.

### **Participant characteristics**

Participants in five studies were either cancer patients or survivors. One study (Zernicke et al., 2014) delivered the MBI to individuals suffering from chronic irritable bowel syndrome (IBS), and another to migraineurs (Feuille & Pargament, 2015). The



five remaining studies' participants were not recruited from physical health or distressed populations. All studies (excepting Carson et al., 2004) had more female than male participants. Understandably, two studies whose intervention was focused on patients / survivors of breast cancer (Carlson et al., 2016; Henderson et al, 2012) only had female participants.

### **Control groups used**

Eight studies used passive controls (treatment as usual (TAU), waitlist or non-intervention). Of the remaining five studies that included active controls, two had both active and passive controls (Jain et al., 2007; Henderson et al., 2012). The active control groups were roughly matched in time duration and group-based nature to the MBI under study.

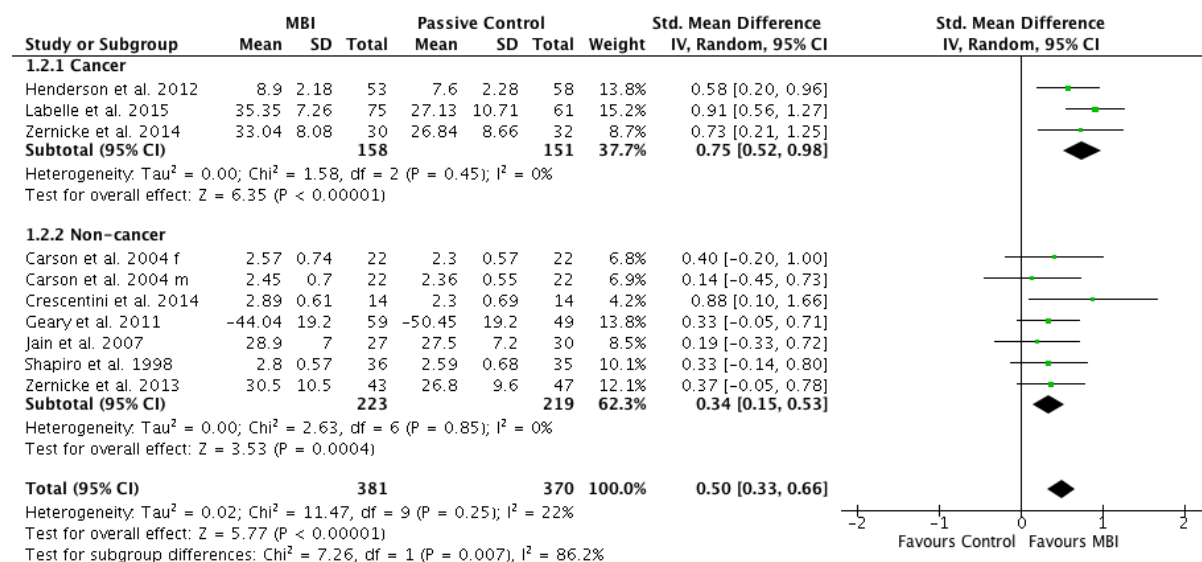
### **Meta-Analysis**

#### **Passive control groups.**

Table 4 shows the forest plot for studies with passive control groups, differentiated by cancer / non-cancer participants. Note that Carson et al. (2004) presented their findings separately for male and female participants, and so these appear separately in the forest plot. In response to the first question of this review, the meta-analysis revealed that participants who had received a MBI showed significantly higher levels of spirituality compared to passive controls at the post-intervention time point ( $z = 5.77$ ,  $p = .00001$ ), with a medium effect size ( $g=0.50$ , 95% C.I.: 0.33 to 0.66). A chi-squared test showed that effect sizes were not significantly heterogeneous across studies ( $\chi^2(9)=11.47$ ,  $p=0.25$ ), supporting their aggregation into a single pooled estimate.

**Table 4**

Forest plot and meta-analysis table for studies with passive control groups, differentiated by cancer / non-cancer participants, at post-intervention.



### Subgroup analysis: cancer vs non-cancer participants.

Three studies with passive control groups focused their intervention on patients / survivors of cancer (Table 4). Participants who had experiences of cancer had significantly higher levels of spirituality compared to control, post-intervention ( $z=6.35$ ,  $p = .00001$ ), with an effect size in the medium to large range ( $g=0.75$ , 95% C.I.: 0.52 to 0.98). The effect sizes in this sub-group were not significantly heterogeneous ( $\chi^2(2)=1.58$ ,  $p=0.45$ ). Non-cancer MBI participants also significantly differed from controls on post-intervention spirituality measures ( $z=3.53$ ,  $p = .00004$ ), but with a small to medium effect size ( $g=0.34$ , 95% C.I.: 0.15 to 0.53). The effect sizes in this sub-group were also not significantly heterogeneous ( $\chi^2(6)=2.63$ ,  $p=.85$ ). Importantly, the difference between the two sub-groups was significant ( $\chi^2(1)=7.26$ ,  $p= .007$ ), indicating that the cancer sub-group showed significantly

greater improvements on spirituality measures following a MBI, relative to control, compared to the non-cancer group.

### Publication bias

Figure 3 shows the funnel plot for studies with a passive control group. The effect sizes of the ten data sets do not show a marked asymmetry around the mean effect size indicating that there is not an obvious publication bias.

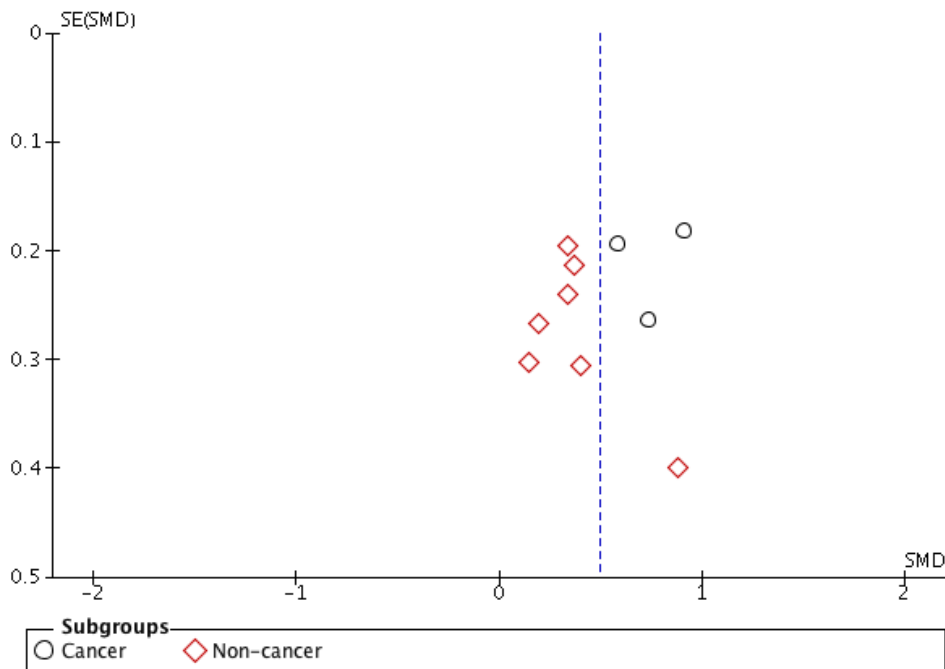


Figure 3. Funnel plot for studies with a passive control group.

### Active control groups.

Table 5 shows the forest plot for studies with active control groups. Owing to the reduced number of studies, no differentiation was made between cancer / non-cancer participants.

**Table 5**

Forest plot and meta-analysis table for studies with active control groups at post-intervention.

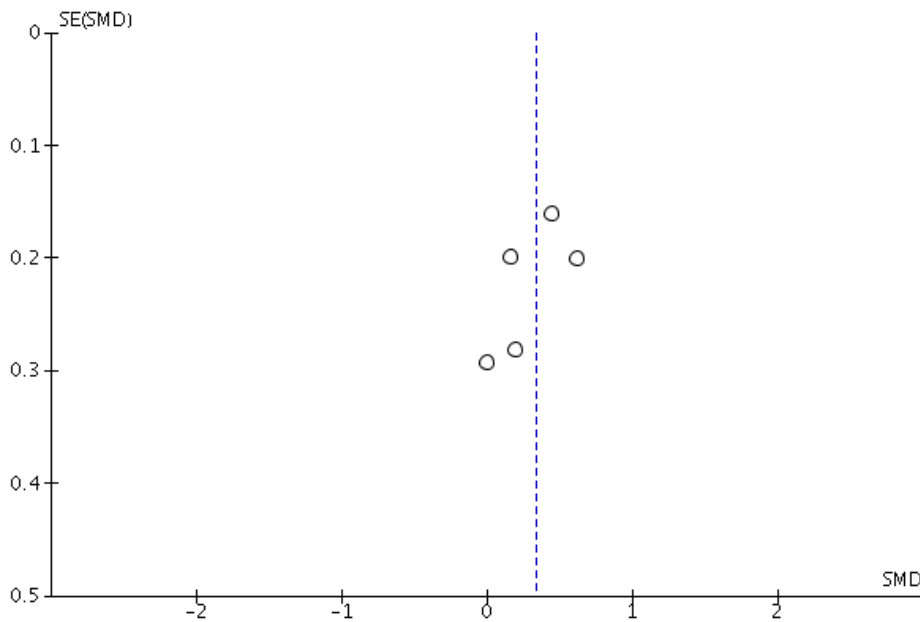
Study or Subgroup	MBI		Active Control		Total	Weight	Std. Mean Difference IV, Random, 95% CI	Std. Mean Difference IV, Random, 95% CI
	Mean	SD	Mean	SD				
Carlson et al. 2016	34.72	8.73	30.58	9.91	77	31.4%	0.44 [0.13, 0.76]	
Feuille et al. 2015	1.1	1.2	1.1	1.3	25	11.5%	0.00 [-0.57, 0.57]	
Garland et al. 2007	32.1	8.79	30.52	10.05	44	22.5%	0.17 [-0.22, 0.56]	
Henderson et al. 2012	8.9	2.18	7.3	2.88	52	22.3%	0.62 [0.23, 1.01]	
Jain et al. 2007	28.9	7	27.4	7.8	24	12.3%	0.20 [-0.35, 0.75]	
<b>Total (95% CI)</b>	<b>244</b>		<b>222</b>		<b>100.0%</b>		<b>0.34 [0.14, 0.54]</b>	

Heterogeneity: Tau<sup>2</sup> = 0.01; Chi<sup>2</sup> = 4.74, df = 4 (P = 0.31); I<sup>2</sup> = 16%  
 Test for overall effect: Z = 3.27 (P = 0.001)

MBI participants showed significantly higher levels of post-intervention spirituality compared to active controls ( $z = 3.27$ ,  $p = .001$ ), with a small to medium effect size ( $g=0.34$ , 95% C.I.: 0.14 to 0.54). A chi-squared test showed that the effect sizes were not significantly heterogeneous across studies ( $\chi^2(4)=4.74$ ,  $p = .31$ ), supporting their aggregation into a single pooled estimate. As is not uncommon in intervention studies (e.g. Khoury et al., 2013), the overall effect size for MBIs when compared to passive controls was numerically greater than when compared to active controls.

### Publication bias.

Figure 4 shows the funnel plot for studies with an active control group. Effect sizes of the five studies do not appear to show a marked asymmetry around the mean effect size and therefore do not suggest an obvious publication bias. However, the number of studies is small, making the funnel plot not a particularly sensitive test.



**Figure 4.** Funnel plot for studies with an active control group.

#### **Study methodological quality.**

Table 3 shows the Jadad ratings of the controlled trials. The median Jadad rating was 2.00 out of a maximum possible score of five, with a range of 0-5. Despite ratings being somewhat low, suggesting poorer study quality, this may be due to a mismatch between Jadad criteria and this meta-analysis' inclusion criteria; Jadad ratings consider quality of randomisation as a means of evaluating randomised control trials while this meta-analysis included controlled trials even in the absence of sufficient or any random allocation (Labelle, Lawlor-Savage, Campbell, Faris, & Carlson, 2015; Crescentini et al., 2014; Feuille & Pargament, 2015; Geary & Rosenthal, 2011; Garland, Carlson, Cook, Lansdell, & Speca, 2007) resulting in lower scores for these studies. Without randomisation there can be a risk of selection bias. Nevertheless, Jadad ratings were not significantly correlated with effect size ( $r_s = 0.23$ ,  $p = 0.44$ ), suggesting that effect sizes were not affected by study quality, at least as rated by Jadad criteria. Additionally, there was a lack of heterogeneity in

effect sizes supporting the pooling of data across all studies irrespective of randomisation procedures.

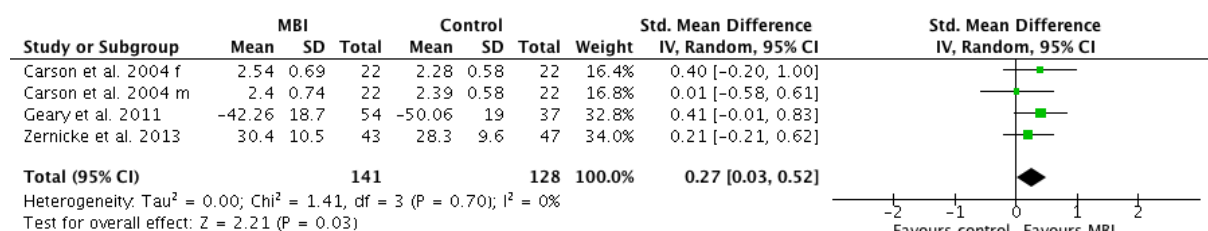
### Follow-up.

Out of the twelve studies included in the meta-analysis, five included follow-up time-point(s). Further analyses of follow-up data were performed. The remaining five studies differed such that three of the studies used a passive control group with a non-cancer sample and two used an active control group with a cancer sample. As such, two separate analyses were performed.

Table 6 shows the forest plot for studies with passive control and non-cancer sample. Follow-up was performed at either three or six months after the intervention. Note that, as previously, data from Carson and colleagues (2004) was divided between male and female participants.

**Table 6**

Forest plot and meta-analysis table for studies with passive control groups and non-cancer sample at follow-up.



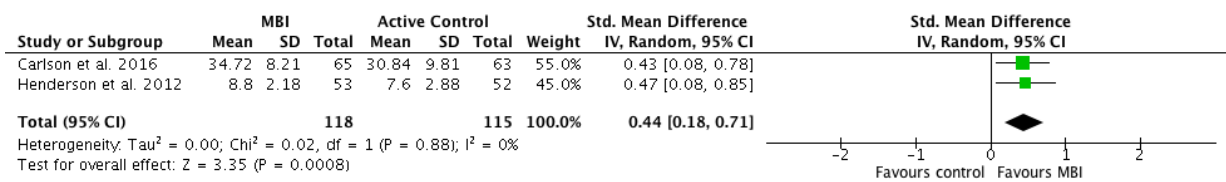
In a demonstration of the efficacy of MBIs in generating sustained increases in spirituality, MBI participants showed significantly higher levels of spirituality compared to passive controls at the follow-up time point ( $z = 2.21$ ,  $p = .03$ ), with a small to medium effect size ( $g=0.27$ , 95% C.I.: 0.03 to 0.52). A chi-squared test

showed that the effect sizes were not significantly heterogeneous ( $\chi^2(3)=1.41$ ,  $p=0.70$ ), again supporting their aggregation.

Table 7 shows the forest plot for studies with active controls and cancer samples. Follow-up was performed 12 months after the intervention in both studies.

**Table 7**

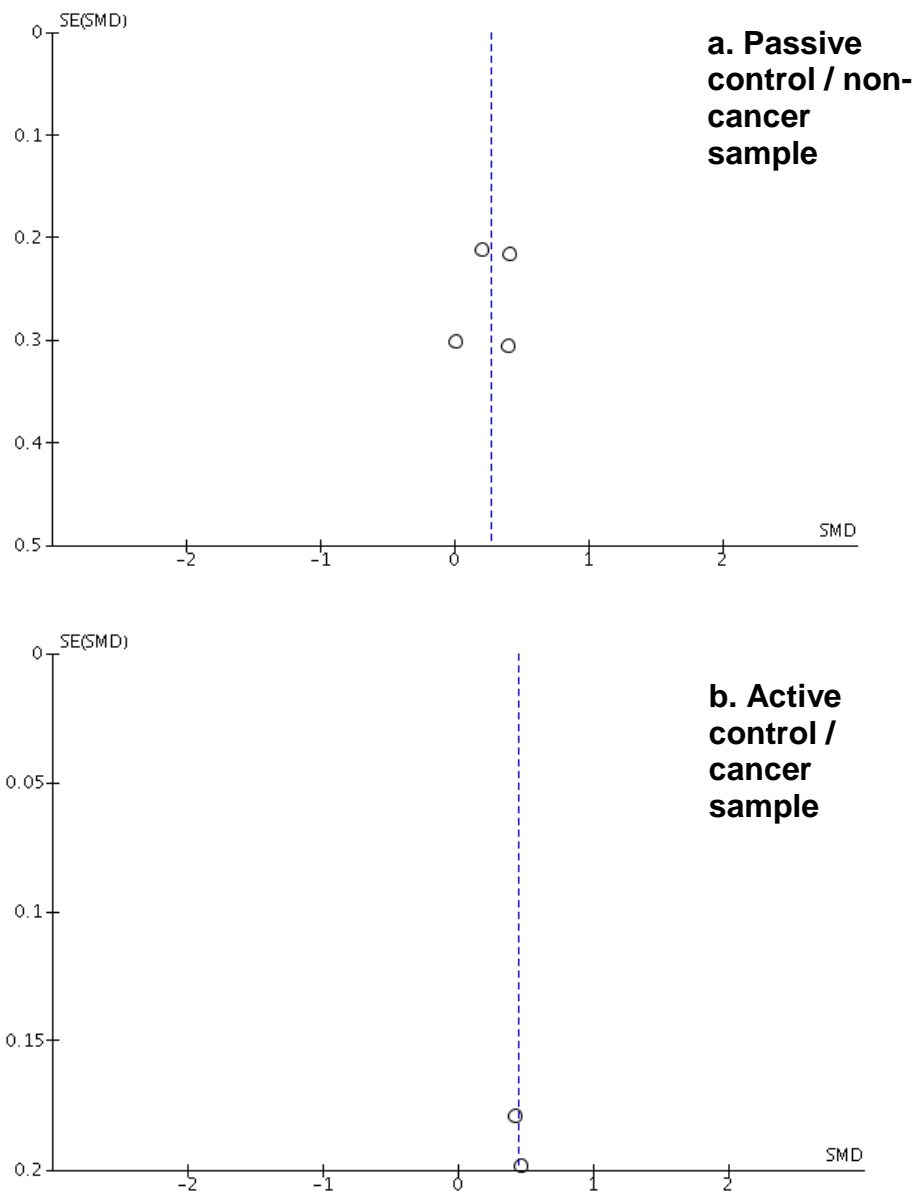
Forest plot and meta-analysis table for studies with active control groups and cancer sample at follow-up.



As with the other follow-up analysis, MBI participants maintained significantly higher levels of spirituality compared to active controls at the follow-up time point ( $z = 3.35$ ,  $p < .001$ ), with a medium effect size ( $g=0.44$ , 95% C.I.: 0.18 to 0.71). A chi-squared test showed that the effect sizes were not significantly heterogeneous ( $\chi^2(1)=0.02$ ,  $p=0.88$ ). Owing to the two sub-groups of follow-up data differing along two dimensions (passive/active control; cancer/non-cancer sample), further comparison of these groups is confounded and therefore not meaningful.

### Publication bias

Figures 5a and b show the funnel plots for follow-up studies. Effect sizes of the studies do not appear to show marked asymmetry around the mean effect size and therefore do not suggest an obvious publication bias, although with so few data points these are not a particularly meaningful measure.



**Figure 5.** Funnel plots for studies with follow-up data.

### Narrative review

Narrative review, per the levels of evidence framework (Carlson, 2012), will now consider studies not included in the meta-analysis as well as any nuances in study findings to answer question 1; do secular MBIs increase spirituality?



### **Randomised control trials.**

Ten RCTs were included in the review. Seven studies reported significantly greater improvements in spirituality scores post-intervention compared to controls (Astin, 1997; Carson et al., 2004; Carlson et al., 2016; Henderson et al., 2012; Shapiro et al., 1998; Wurtzen et al., 2015; Zernicke et al., 2014 ). Three of these studies had follow-up measures, one finding that the MBI group did not maintain increases in spirituality compared to control at follow-up (Wurtzen et al., 2015), and two indicating that spirituality gains were maintained compared to controls (Carlson et al., 2016; Henderson et al., 2012). Indeed, in the latter study, the only significant group difference between MBI and control maintained at follow-up, across a battery of outcome measures, was the spirituality score (Henderson et al., 2012).

The three studies that did not show significantly greater increases in spirituality for the MBI group compared to controls used both active (Jain et al., 2007; Oman et al., 2007) and passive (Zernicke et al., 2013) controls. Understandably, the control used in the study by Oman et al. (2007) was a spiritual meditation intervention (passage meditation) that resulted in greater improvements in spirituality for this group than the secular MBI group. Meanwhile, in the study of IBS sufferers, even the waitlist controls demonstrated improvements in physical symptoms over the course of the study, despite IBS being a chronic condition (Zernicke et al., 2013). The authors considered the anticipatory effects of a MBI, as well as continued researcher and self- monitoring effects, as potentially offering a placebo-like improvement. Placebo effects have previously been shown to significantly reduce symptoms in IBS sufferers (Zernicke et al., 2013). As such, the improvements in spirituality may have been accounted for in part by these factors. Finally, the shorter

intervention of only one month in the study by Jain et al. (2007) may have accounted for the lack of significant group differences.

Two of the RCTs that demonstrated improvements in spirituality compared to controls used active control groups; nutrition education programme (NEP; Henderson et al., 2012), and supportive expressive group therapy (SET; Carlson et al., 2016). These are important findings for demonstrating that while controlling for nonspecific therapeutic factors (e.g. group support and sharing, attention from caring professionals, self-monitoring and enhancements to self-efficacy (Carlson et al., 2016)) the MBIs offered greater, lasting, specific and unique benefits to increasing spirituality. Nonetheless, in a secondary analysis of data from Carlson et al., (2016), class attendance at the MBI was shown to be significantly correlated with increases in spirituality, with class attendance accounting for 31.9% of the variance in spirituality scores (Tamagawa et al., 2015). Taken together, the findings suggest that both nonspecific and MBI-specific therapeutic factors contribute to increasing spirituality with greater attendance at the MBI enhancing the opportunities to benefit from both.

### **Pseudorandomised control trials.**

Two quasi-RCTs were included in the review. One adapted a TAU CBT group for pain management to include MM components for supporting patients with chronic non-cancer pain (CNCP) (Mawani, Rashiq, Verrier, & Dick, 2014). Compared to the TAU active control, there were no significant differences in spirituality measures for the MBI. This may be because: a) participants in this study were experiencing such an intense degree of CNCP that they had already been referred to psychological services; MM interventions may have better served patients with less intractable

CNCP. b) The therapeutic overlap between the MBI and TAU active control was very high; the original CBT group was merely given a bolt-on MM component and already included relaxation and breathing exercises. As such, the MBI condition may not have meaningfully added further MM ingredients compared to the control.

The other quasi-RCT found that the secular MM group did not show significant increases in spirituality compared to the control group (Feuille & Pargament, 2015). However as noted above, this was a brief one-off introduction to MM with further instructions for home practice, possibly attenuating effects of the MBI.

#### **Comparative study with concurrent controls.**

Four comparative studies with concurrent controls were included in the review. All found that the MBI group resulted in greater increases in spirituality than active (Garland et al., 2007) or passive (Crescentini et al., 2014; Geary & Rosenthal, 2011; Labelle et al., 2015) controls, which was maintained at 12 month follow-up (Geary & Rosenthal, 2011). Additionally, Crescentini et al. (2014) were the only researchers within this review to use an alternative measure of spirituality to explicit self-report. They modified the Implicit Attitudes Test (IAT; Greenwald, McGhee, & Schwanz, 1998) to investigate implicit attitudes to religiosity and spirituality (RS-IAT). The MBI increased scores on the RS-IAT for those participants with low baseline implicit religiosity / spirituality compared to controls. Nevertheless, the authors raise concerns about drawing too many conclusions from this data as they found a modulatory effect of the MBI on performance in the RS-IAT, at least in those subjects showing low baseline RS-IAT scores. As such, the change in RS-IAT scores may be

due to greater motivation to engage with post-measures having experienced the MBI as opposed to fundamental changes in implicit representations.

### **Case series / pretest, posttest.**

Fourteen studies that were either a) designed a-priori as a pre- post-intervention without controls, or b) were secondary analyses of controlled studies that treated the data as a case series, were included in the review. Of the former (n=11), eight studies showed an improvement in spirituality scores following the MBI (Birnie, Speca, & Carlson, 2009; Carmody et al., 2008; Dobos et al., 2015; Fish, Ettridge, Sharplin, Hancock, & Knott, 2014; Flugel Colle et al., 2010; Greeson et al., 2015; Greeson et al., 2011; Tacon, 2011), while three studies did not (Ando, Kira, Hayashida, & Ito, 2016; Lengacher et al., 2010; Roberts & Montgomery, 2015). Of these three studies, two were brief 2-session interventions (Ando et al., 2016; Roberts & Montgomery, 2015) and one used questionnaires that asked about religiosity as opposed to spirituality (Lengacher et al., 2010). This measure may have masked changes in spirituality independent of religious reference; see discussion for further consideration of measures and constructs.

### **Summary**

The meta-analyses and narrative review found that in general, secular MBIs increase spirituality compared to controls, both post-intervention and at follow-up. Effect sizes for cancer participants were larger than those with non-cancer participants. As might be expected, effect sizes for studies with active controls were numerically smaller than those with passive controls. Nevertheless, the significant effect size when compared to active controls indicates that there are additive benefits to spirituality

from MBIs beyond generic factors. However, it is important to note that the active ingredient of MBIs is still unclear; while it may be tempting to conclude that MM alone was the additive benefit of MBIs compared to active controls, other possibilities exist (e.g. relaxation response, motivation / commitment to intervention, plausibility of intervention etc.).

These studies used over ten different measures of spirituality and multiple forms of secular MBI with evidence mostly consistent across measures and MBIs. However, all studies (but one: Crescentini et al., 2014) used self-report measures of religiosity/spirituality, which could result in systematic biases in data collection, such as social desirability (Podsakoff & Organ, 1986). Of the studies that did not show significant increases in spirituality, many were of short duration or used interventions with more minimal MM components, restricting the opportunity for participants to fully inculcate the changed ways of being suggested by MBIs.

Two trends across the studies reviewed may limit the generalisability of findings: 1) most studies used MBSR (Kabat-Zinn, 1990) or a MBI modelled on MBSR, 2) all studies (but one; Carson et al., 2004) had more female participants than male participants. This calls into question whether other MBIs modelled differently to MBSR (e.g. MBCT; Segal et al., 2002), or male participants, will produce/experience increases in spirituality similarly to the MBIs/participants under review.

**Question 2: Are increases in spirituality an additional mechanism / mediator by which MBIs achieve positive outcomes, or a moderator of the effects of MBIs?**

Narrative review of studies was used to consider evidence for mediation and moderation.

## **Mediation**

The review will first consider lower levels of evidence for mediation in the form of associations between spirituality and outcomes before reviewing higher levels of evidence from formal mediation analyses.

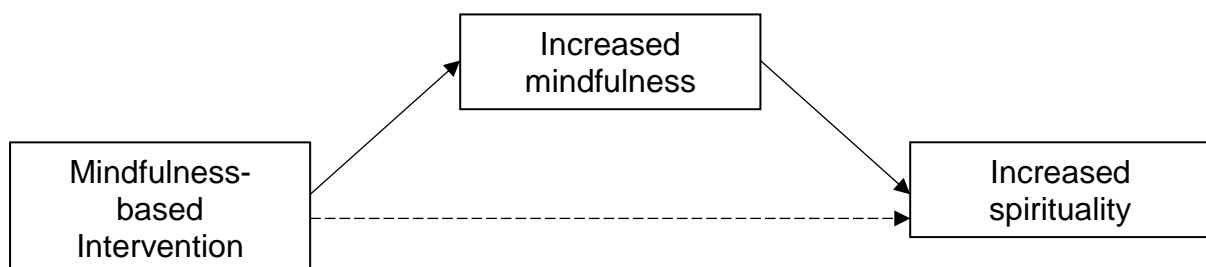
### **Associations between spirituality and outcomes.**

While Astin (1997) found no correlations between higher INSPIRIT scores and decreased symptomology, others found that increases in spirituality scores correlated with; increases in self-compassion scores (Birnie et al., 2009), increases in mindfulness (Fish et al., 2014), decreases in stress and mood disturbance (Garland et al., 2007), and increases in state and trait mindfulness (independently), with multivariable models showing decreases in psychological (depression and anxiety) and physiological symptoms associated with both changes in spirituality and changes in trait mindfulness (Carmody et al., 2008). Additionally, for patients with CNCP changes in spirituality were significantly correlated with changes in pain, with spirituality accounting for 23% of the variance in changes in evaluative aspects of pain (Mawani et al., 2014). Moreover, even when controlling for baseline depression scores, age, sex and religious affiliation, hierarchical multiple regressions revealed that changes in both mindfulness and spirituality uniquely explained reduction in depression scores, with small to medium effect sizes (Greeson et al., 2015). While these results are associative and so statistical mediation cannot be imputed, they indicate that changes in spirituality may a) be interconnected with both physical and psychological improvements, b) changes in mindfulness may also be a result of changes to spirituality / result in wellbeing improvements.

## Formal mediation analyses

Three studies performed formal mediation analyses. Shapiro et al. (1998) used hierarchical regressions to indicate that decreases in trait anxiety lead to decreases in depression and state anxiety, which in turn predicted increases for INSPIRIT scores, consistent with the possibility that reductions in distress predict increases in spirituality. This might imply that there is an indirect causal pathway from MBI to increases in spirituality, mechanistically driven via changes to trait anxiety. However, other related constructs such as state or trait mindfulness were not measured in this early experiment, which may be important components in understanding mechanistic pathways.

Labelle et al. (2015) used causal steps linear regression followed by non-parametric bootstrapping to test the significance of mediated effects (Baron & Kenny, 1986; Hayes, 2009). However, contrary to the proposed mediation model in Figure 1a), the authors tested a model with spirituality positioned as an outcome dependent variable, while placing mindfulness (measured by the Five-Facet Mindfulness Questionnaire (FFMQ; Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006)) as the mediating variable between the MBI and spirituality, see Figure 6.

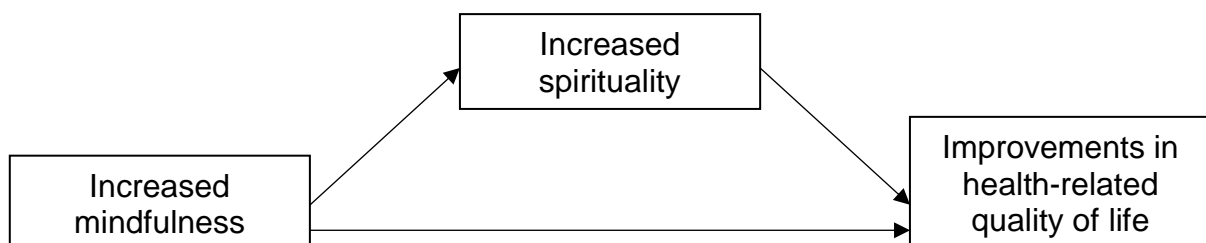


**Figure 6.** Schematic of the mediation model investigated by Labelle et al. (2015).

The authors found that increases on all facets of the FFMQ mediated the pathway from MBI to enhanced spirituality (as well as post-traumatic growth)

(Labelle et al., 2015). Attending to present-moment experience ('Observe' facet) was numerically the strongest mediator of the effects of the MBI. This finding is consistent with the causal model that MBIs lead to increased mindfulness, which in turn leads to increased spirituality (Labelle et al., 2015). Nevertheless, the study did not further investigate the mechanisms by which increased spirituality might predict improvements in wellbeing. Moreover, as mindfulness and spirituality were measured in the study at the same timepoint (thereby removing temporal precedence from the analysis) there may be ambiguity in the directionality of mediation (Kraemer, Stice, Kazdin, Offord, & Kupfer, 2001). It would have been helpful to have also conducted a reverse mediation analysis, switching mindfulness and spirituality as predictor/mediator, which may have suggested bi-directional pathways if significant.

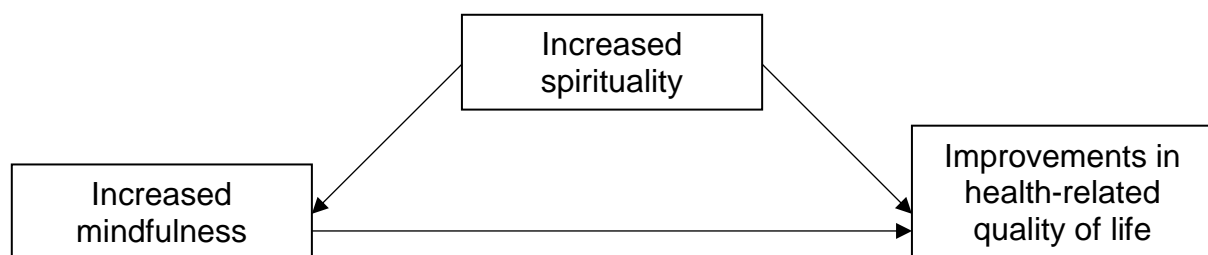
Greeson et al. (2011) performed a mediator analysis, using a conceptual model shown in Figure 7. A-priori path analyses did not support the proposed mediation model; although both increased spirituality and increased mindfulness were directly associated with improved mental health following the MBI, the path linking increased mindfulness to increased spirituality was not significant (Greeson et al., 2011), in contrast to the findings of Labelle et al. (2015) above.



**Figure 7.** Schematic of the mediation model proposed by Greeson et al. (2011), in which change in spirituality is a partial mediator of the relationship between change in mindfulness and change in health-related quality of life outcomes.



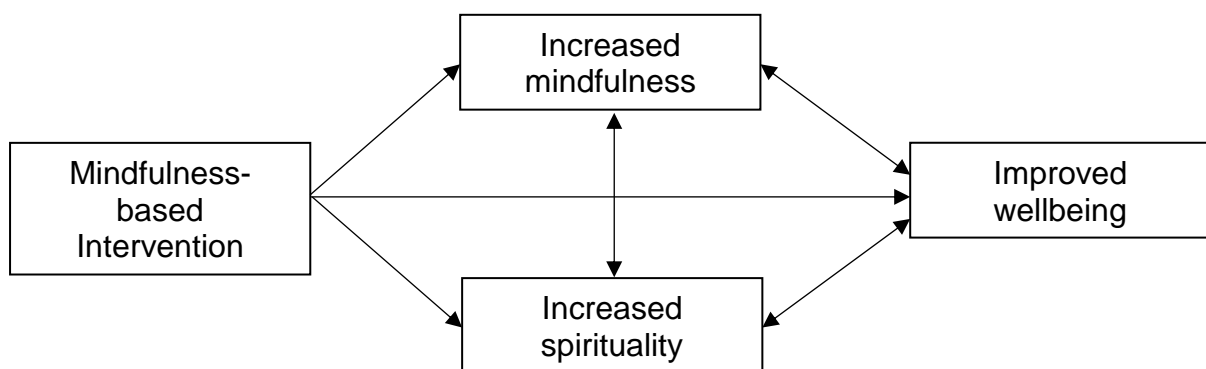
The authors therefore used an exploratory mode of data analysis (Kline, 2004). Despite the lack of temporal precedence, the exploratory analysis switched directions of predictors to investigate model best-fit, adding a direct path from increased spirituality to increased mindfulness, allowing the possibility for changes in spirituality and mindfulness to be bi-directional. The path from increased spirituality to increased mindfulness was significant, while the path in the opposite direction remained non-significant. The final best-fit mediation model (see Figure 8) was consistent with the interpretation that increased spirituality following a MBI accounted for improved mental health both directly and indirectly as a function of increased mindfulness (Greeson et al., 2011).



**Figure 8.** Schematic of the final mediation model suggested by Greeson et al. (2011), in which increases in spirituality following a MBI may partially explain improvements in mental health as a function of greater mindfulness. Note that this figure differs from Figure 11 in terms of the direction of the path between mindfulness and spirituality.

The differences between the paths found to be significant in this study (Greeson et al., 2011) as opposed to those in the study by Labelle et al. (2015) may be due to both studies using entirely different measures of spirituality and mindfulness, possibly tapping distinct constructs within the panoply of what might constitute 'spirituality' or 'mindfulness' (see Discussion). Nevertheless, these accumulated findings of: a) a significant path from increased mindfulness to increased spirituality (Labelle et al., 2015), b) a significant path in the opposite

direction (Greeson et al., 2011), c) a significant path from reduced trait anxiety to spirituality (Shaprio et al., 1998) described above, suggest that future studies should investigate a more comprehensive mediation model, proposed in Figure 9. This model considers the possibility of multi-directional causal pathways between MBI / mindfulness / spirituality / wellbeing, and the possible interconnectedness of these constructs.



**Figure 9.** Proposed comprehensive mediation model, considering possible multi-directional causal pathways between constructs

Finally, the opposing findings of Labelle et al. (2015) and Gresson et al. (2011) call into question whether mindfulness and spirituality are completely distinct constructions. Rather than the findings indicating a possible bi-directional mediating relationship, they might instead be accounted for because the mindfulness and spirituality measures are tapping overlapping constructs.

### **Moderation**

Three studies performed moderator analyses. Using pre- and post- measures from a large community-based MBSR sample, Greeson et al. (2015) found that neither baseline spirituality nor religious affiliation (or sex, age, trait mindfulness, motivation for religious growth) moderated the reduction in depressive symptoms following a

MBI, suggesting that MBIs are beneficial across individual differences of dispositional spirituality / religiosity. However, while the sample was well-powered, the use of an intention-to-treat sample may have overlooked statistical moderators following participant attrition.

A secondary analysis of data from a large RCT of MBCR for breast cancer survivors (see Carlson et al., 2016), used moderator analyses to reveal that while a) there were no significant moderation effects of personality variables on spirituality scores, suggesting that increases in spirituality are just as likely across personality factors, b) there was a moderation effect of preference on spirituality scores, such that participants who received their preferred intervention group showed greater increases in spirituality compared to those who were allocated to their non-preferred group (Carlson et al., 2014). Noteworthy, most participants expressed a preference for the MBI; it could be that MBIs show greater improvements in spirituality owing to meeting participants' preferences, rather than MBI-specific therapeutic factors (Carlson et al., 2014).

Another secondary analysis of RCT data (see Zernicke et al., 2014) found age to moderate spirituality scores such that younger participants reported greater increases in spirituality compared to older participants (Zernicke et al., 2016). However, this may have been due to the intervention being delivered online with younger participants being more familiar and comfortable with internet-based material and social networks (Zernicke et al., 2016). Finally, the sub-group findings from the meta-analysis above revealed that the experience of cancer moderated spirituality outcomes, such that those with an experience of cancer were more likely to show increased spirituality following a MBI, compared to people with no experience of cancer.

## Summary

Several studies demonstrated associations between increased spirituality scores and improvements in wellbeing, as well as associations with mindfulness, using both simple univariate correlations as well as multivariate analyses with potential confounders as additional predictors. Three formal mediation analyses produced a mixed picture of possible directional pathways, resulting in the proposal of a more comprehensive multi-directional model (Figure 9). None of the mediation analyses incorporated temporal precedence, impairing imputations of directionality within the statistical mediation models. Nevertheless, the inclusion of reverse-mediation modelling by one study helpfully considered bi-directional causal pathways between increased spirituality and increased mindfulness, though distinguishing between these two constructs and their associated measures also requires further investigation.

Dispositional variables of personality, spirituality and religiosity did not moderate the effects of MBIs for increasing spirituality, suggesting that a broad range of people can spiritually benefit from MBIs. Meanwhile the meta-analysis above revealed that the experience of cancer can result in augmented increases in spirituality compared to people without the experience of cancer. Combining the review of mediation and moderation findings leads to an interesting possibility; even though MBIs may function mechanistically via-, and result in increases in- spirituality, less-spiritual people are just as likely to experience increased spirituality from a secular MBI as more-spiritual people.

## Discussion

Numerous studies and reviews chart the broad array of positive outcomes that arise from both MBIs (e.g. Khoury et al., 2013) and that are associated with a person experiencing greater religiosity / spirituality (e.g. Koenig, 2009). This is the first review to consider the effects of secular MBIs on spirituality. It asked two questions: i) do secular MBIs increase spirituality, and ii) if so, is there evidence to indicate possible mediating or moderating effects of spirituality on outcomes. Following a systematic search, meta-analysis and narrative review of the literature empirically investigating MBIs, this review has found that in general, secular MBIs do increase levels of self-reported spirituality, with increases maintained at follow-up. Effect sizes for improvements were greater when compared to passive controls than active controls, suggesting that some of the variance in increased spirituality can be accounted for by non-MBI specific therapeutic factors. Nevertheless, effect sizes for studies that used active controls were still small to medium, indicating that MBIs uniquely contribute to increases in spirituality beyond generic factors. Evidence for the moderating role of baseline spirituality was not found, but depending on the proposed mediation model, increased spirituality was found to be mediated by increased mindfulness (Labelle et al., 2014) and decreased trait anxiety (Shapiro et al., 1998). In turn, increased spirituality operated in the opposite direction, improving psychological wellbeing via increased mindfulness as a partial mediator (Greeson et al., 2011). These findings led to the proposal of a more comprehensive mediation model (Figure 9) that considers issues of multi-directional causality among the constructs of MBI, state and trait mindfulness, spirituality and wellbeing outcomes, which would need to be tested in future research.

Studies in which participants were either survivors or patients of cancer showed significantly greater increases in spirituality compared to non-cancer participants, possibly as a result of having lived experience of 'existential plight' (Weisman & Worden, 1977). Interestingly, while cancer is a moderator of the effects of MBIs on spirituality, baseline spirituality is not, suggesting that having higher dispositional spirituality alone does not indicate a greater penchant for further spiritual development or improvements in wellbeing. The literature suggests that 'existential plight' may be synonymous with a 'search for meaning' following a cancer experience (Lee, 2008, p. 779); evidence indicates that global meaning (the general sense that life has order and purpose) is a key predictor of overall quality of life (Lee, 2008). Perhaps it is this predilection to search or 'make meaning' (Lee, 2008) that affords those with an experience of cancer greater opportunity for spiritual increases following a MBI.

Excepting one study that measured implicit religious/spiritual beliefs (Crescentini et al., 2014), all other studies used explicit self-report measures of spirituality (and mindfulness, where relevant). Moving beyond generic critiques of this type of data gathering (e.g. Fan et al., 2006), each of the many measures of spirituality across the studies will implicitly contain a different construct of spirituality (Monod et al., 2011). Carmody et al.(2008) draw attention to whether measures include explicit reference to God (e.g. INSPIRIT; Kass et al., 1991) as a criterion for spirituality, or are more 'secular' in nature (e.g. FACIT-sp; Peterman et al., 2002). For many, 'spirituality' and 'religion', the latter with greater God associations, have become distinct and independent constructs (Thoresen & Harris, 2002) with a growing notion that spirituality may be associated with health independent of religious affiliation (Koenig, George, & Titus, 2004). As such the construct validity of

spirituality measures needs to be considered in light of changing approaches to what spirituality means within society (Koenig, 2008). Similar debates regarding the very possibility of measuring and defining mindfulness are present in the literature (e.g. Nilsson & Kazemi, 2016; Offenbacher et al., 2011). There may be overlap between the constructs of mindfulness and spirituality on certain measures, though recent neuroscientific findings suggest that the neural activity resulting from mindfulness practice is distinct from spiritual practice (Barnby, Bailey, Chambers & Fitzgerald, 2015). Some of these issues could be determined empirically by finding the extent to which different measures are intercorrelated. In this review's meta-analyses, the absence of significant heterogeneity supported the pooling of different spirituality measures, despite the concerns raised above.

The review also found that increased spirituality was associated with increased mindfulness and with improved wellbeing. Speculation exists regarding these overlapping interactions. Greeson et al. (2011) consider the possible overlap between the Buddhist 'path of purification' (when the mind can turn away from constantly monitoring experience to a subtler present-moment reality), and the 'figure / ground perception' principle in Gestalt psychology (see Flickstein (2001) upon which these ideas are based). Perhaps mindfulness training allows people to more easily shift their 'view' between the "foreground and background of experience" (Greeson et al., 2011) in such a way as to allow awareness and experiences of spirituality to be more noticeable. Rather than being mostly preoccupied with 'foreground' ruminations (Segal et al., 2002; Jain et al., 2007) participants may have been better able to shift their attention to 'background' experiences such as beauty, joy, connection and awe; all associated with spirituality (Greeson et al., 2011). Carmody et al. (2008) also consider reductions in rumination and preoccupations

with daily worry as creating 'mental space' to more deeply experience spirituality, and relate this to the mindfulness mechanism of 'reperceiving' (Shapiro et al., 2006).

With respect to the finding that the 'Observe' facet of the FFMQ was the numerically strongest mediator of MBI effects on spirituality (Labelle et al., 2015), the researchers similarly theorise that greater awareness of internal and external experiences in each moment may lead to feelings of being in sync with one's environment as well as offering a more profound sense of meaning and appreciation of life. Additionally, learning to observe the flux of internal thoughts and emotions as opposed to being overtaken by them may generate feelings of harmony and peace, which have been proposed as key components of spirituality (Peterman et al., 2002). While these spiritual experiences may in their own right ameliorate distress and enhance wellbeing, increased spirituality may also improve wellbeing by in turn changing health practices, offering social support, improving psychosocial resources and supporting helpful belief structures (George et al., 2009). Thus, although the MBIs included in this review are secular in nature without specifically targeting spirituality, these outcomes may occur organically as mindful engagement with 'background' experience is facilitated (Mackenzie, Carlson, Munoz, & Speca, 2007).

In a recent mixed-methods investigation into reasons for practicing MM very few participants commenced or continued meditation practice for spiritual or religious reasons (Pepping, Walters, Davis, & O'Donovan, 2016), despite this review's consistent findings that MBIs increase spirituality and that increases in spirituality are associated with wellbeing outcomes. Therefore, increases in spirituality that arise from secular MBIs may be a latent or less explicit benefit, more easily discerned when not openly interrogated with religious / spiritual language (such as with the FACIT-sp, as opposed to the INSPIRIT). This may be due to the Western context of



many of the MBIs in this review in which the spiritual components of MBIs are not stressed (Pepping et al., 2016), with many participants considering that the secular stance of MBIs facilitates the exploration of spirituality in an unthreatening way (Mackenzie et al., 2007). In other words, people become more 'spiritual' because of secular MBIs without necessarily explicitly wanting to or openly identifying as such. This is theoretically consistent with the finding reported earlier that baseline spirituality does not moderate increases in spirituality following a secular MBI (Greeson et al., 2015).

### **Limitations**

There are several limitations to this review. The first involves the narrow eligibility criteria to only include intervention studies involving secular MBIs with quantitative measures of spirituality. This meant excluding: qualitative work that could have further enriched the understanding of effects of MBIs on spirituality (e.g. Mackenzie et al., 2007), correlational analyses to further understand associations between state/trait mindfulness and spirituality (e.g. Lazaridou & Pentaris, 2016; Leigh, Bowen, & Marlatt, 2005; Cobb, Kor, & Miller, 2015), and interventions that used more overtly spiritual forms of MM (e.g. Grabbe, Nguy, & Higgins, 2012). Nevertheless, the strong quantitative finding from this review, as well as the large number of studies that fit these narrower criteria, justifies the approach taken.

There are further limitations in the generalisability of findings. All studies bar one (Carson et al., 2004) had an uneven gender distribution, with mostly female participants. Extrapolating the effects of MBIs for increasing spirituality in men is therefore more difficult, particularly in light of the finding that there were no significant improvements in spirituality outcomes for men following an MBI while there were for

women (Carson et al., 2004) and recent research showing that women have more favourable responses and enhanced wellbeing outcomes than men following an MBI (Rojiani, Santoyo, Rahrig, Roth & Britton, 2017). It may be helpful for future reviews to obtain data for male and female participants separately; this may indicate even higher effect sizes for women and lower effect sizes for men (which have been averaged together in the current review). Additionally, most studies used either MBSR (Kabat-Zinn, 1990) or a form of MBSR as their MBI, limiting generalisability to other MBIs, such as MBCT (Segal et al., 2002). Finally, almost half of the studies reviewed (n=14) were with people that had lived experience of cancer. Inferences from this group to people that have never experienced an 'existential plight' (Weisman & Worden, 1977) are difficult, particularly following the significant subgroup differences at meta-analysis.

### **Future research**

While the evidence reviewed strongly suggests that spirituality increases following participation in secular MBIs, mechanisms of action are still not well understood. Future studies might utilise sufficient power and be designed in such a way as to further investigate mechanisms and causal pathways, perhaps using Figure 9 as a proposed model for structural equation modelling. Dismantling studies may aid the researcher to isolate key components of change. Additional work could also consider the dichotomy between the secular context of MBIs on the one hand and latent spiritual changes that arise from them on the other. For example, explicitly inducting participants to the different aspects of MBIs, either the spiritual Buddhist component or the secular scientific one, while evaluating effects on outcomes might help

elucidate the differential role of inherent spirituality on the one hand and secular context on the other in achieving improvements to wellbeing.

### **Clinical implications**

Based on the associations between MBIs, spirituality and wellbeing presented in this review, it may be tempting to suggest that adding or enhancing overtly spiritual components to MBIs would increase their efficacy. However, the evidence reviewed does not suggest that increasing explicit reference to spirituality within an MBI leads to greater improvements on outcome measures (e.g. Feuille & Pargament, 2015), perhaps for similar reasons to those above regarding the greater accessibility and acceptability of a secular MBI (Marx, 2015). Moreover, it is not clear whether increased spirituality arises from the MBI directly or as an indirect result of improved mindfulness / wellbeing.

Nevertheless, achieving a greater understanding of the positive effects and potential mechanisms of MBIs has clinical importance, allowing clinicians to appreciate additional possible mechanisms by which interventions achieve desired outcomes. Moreover, realising the possible spiritual effects of MBIs may aid both formulation and intervention; if formulating using a biopsychosocial-spiritual approach (Sulmasy, 2002), one might be able to offer an evidence-based intervention that has demonstrated positive associations with increasing spirituality within a secular healthcare system, as opposed to resorting to seeking spiritual interventions from third-sector religious/spiritual organisations. Finally, an ethical component arises; it may be appropriate for MBIs to be presented as psychosocial-spiritual interventions, as opposed to merely psychosocial ones, to better reflect their nature and mechanisms.

## **Conclusion**

There is strong and consistent evidence for secular MBIs increasing measures of self-reported spirituality. However, understanding the mechanisms by which this occurs and associations between changes in spirituality, wellbeing and mindfulness require further investigation. It is possible that distinguishing between secular and spiritual elements of MBIs may help elucidate underlying therapeutic change factors.

## References

- Ando, M., Kira, H., Hayashida, S., & Ito, S. (2016). Effectiveness of the mindfulness art therapy short version for Japanese patients with advanced cancer. *Art Therapy, 33*, 35-40. <http://doi.org/10.1080/07421656.2016.1128764>
- Arch, J. J., & Craske, M. G. (2006). Mechanisms of mindfulness: Emotion regulation following a focused breathing induction. *Behaviour Research and Therapy, 44*, 1849-1858. <http://doi.org/10.1016/j.brat.2005.12.007>
- Armstrong, T. D. (1995, August). Exploring spirituality: The development of the Armstrong measure of spirituality. Paper presented at the annual convention of the American Psychological Association, New York, NY.
- Astin, J. A. (1997). Stress reduction through mindfulness meditation. *Psychotherapy and Psychosomatics, 66*, 97-106. <http://doi.org/10.1159/000289116>
- Avants, S. K., & Margolin, A. (2004). Development of spiritual self-schema (3-S) therapy for the treatment of addictive and HIV risk behavior: A convergence of cognitive and Buddhist psychology. *Journal of Psychotherapy Integration, 14*, 253. <http://doi.org/10.1037/1053-0479.14.3.253>
- Baer, R. A. (2003). Mindfulness training as a clinical intervention: A conceptual and empirical review. *Clinical Psychology: Science and Practice, 10*, 125-143. <http://doi.org/10.1093/clipsy.bpg015>
- 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*, 27-45. <http://doi.org/10.1177/1073191105283504>
- Barnby, J. M., Bailey, N. W., Chambers, R., & Fitzgerald, P. B. (2015). How similar are the changes in neural activity resulting from mindfulness practice in

contrast to spiritual practice?. *Consciousness and Cognition*, 36, 219-232.

<http://doi.org/10.1016/j.concog.2015.07.002>

Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51, 1173.

<http://doi.org/10.1037/0022-3514.51.6.1173>

Benner, D. G. (1989). Toward a psychology of spirituality: Implications for personality and psychotherapy. *Journal of Psychology and Christianity*, 5, 19–30.

Bhikkhu, N. (1979). *The path of purification: Visuddhi Magga*. Kandy, Sri Lanka: Buddhist Publication Society.

Birnie, K., Speca, M., & Carlson, L. E. (2010). Exploring self-compassion and empathy in the context of mindfulness-based stress reduction (MBSR). *Stress and Health*, 26, 359-371. <http://doi.org/10.1002/smi.1305>

Carlson, L. E. (2012). Mindfulness-based interventions for physical conditions: a narrative review evaluating levels of evidence. *ISRN Psychiatry*, 2012 : 651583. <http://doi.org/10.5402/2012/651583>

Carlson, L. E., & Speca, M. (2010). *Mindfulness-based cancer recovery*. Oakland, CA: New Harbinger.

Carlson, L. E., Tamagawa, R., Stephen, J., Doll, R., Faris, P., Dirkse, D., & Speca, M. (2014). Tailoring mind-body therapies to individual needs: Patients' program preference and psychological traits as moderators of the effects of mindfulness-based cancer recovery and supportive-expressive therapy in distressed breast cancer survivors. *Journal of the National Cancer Institute Monographs*, 50, 308-314. <http://doi.org/10.1093/jncimonographs/lgu034>

- Carlson, L. E., Tamagawa, R., Stephen, J., Drysdale, E., Zhong, L., & Speca, M. (2016). Randomized-controlled trial of mindfulness-based cancer recovery versus supportive expressive group therapy among distressed breast cancer survivors (MINDSET): Long-term follow-up results. *Psycho-Oncology*, 25, 750-759. <http://doi.org/10.1002/pon.4150>
- Carmody, J., Reed, G., Kristeller, J., & Merriam, P. (2008). Mindfulness, spirituality, and health-related symptoms. *Journal of Psychosomatic Research*, 64, 393-403. <http://doi.org/10.1016/j.jpsychores.2007.06.015>
- Carson, J. W., Carson, K. M., Gil, K. M., & Baucom, D. H. (2004). Mindfulness-based relationship enhancement. *Behavior Therapy*, 35, 471-494. [http://doi.org/10.1016/S0005-7894\(04\)80028-5](http://doi.org/10.1016/S0005-7894(04)80028-5)
- Cella, D. F., Tulsky, D. S., Gray, G., Sarafian, B., Linn, E., Bonomi, A., ... & Brannon, J. (1993). The functional assessment of cancer therapy scale: Development and validation of the general measure. *Journal of Clinical Oncology*, 11, 570-579. <http://doi.org/10.1200/JCO.1993.11.3.570>
- Chambers, R., Gullone, E., & Allen, N. B. (2009). Mindful emotion regulation: An integrative review. *Clinical Psychology Review*, 29, 560-572. <http://doi.org/10.1016/j.cpr.2009.06.005>
- Cobb, E., Kor, A., & Miller, L. (2015). Support for adolescent spirituality: Contributions of religious practice and trait mindfulness. *Journal of Religion and Health*, 54, 862-870. <http://doi.org/10.1007/s10943-015-0046-1>
- Cotton, S., Puchalski, C. M., Sherman, S. N., Mrus, J. M., Peterman, A. H., Feinberg, J., ... & Tsevat, J. (2006). Spirituality and religion in patients with HIV/AIDS. *Journal of General Internal Medicine*, 21, S5-S13. <http://doi.org/10.1111/j.1525-1497.2006.00642.x>

- Crane, R. S., Brewer, J., Feldman, C., Kabat-Zinn, J., Santorelli, S., Williams, J. M. G., & Kuyken, W. (2017). What defines mindfulness-based programs? The warp and the weft. *Psychological Medicine*, 47, 990-999.  
<http://doi.org/10.1017/S0033291716003317>
- Crescentini, C., Urgesi, C., Campanella, F., Eleopra, R., & Fabbro, F. (2014). Effects of an 8-week meditation program on the implicit and explicit attitudes toward religious/spiritual self-representations. *Consciousness and Cognition*, 30, 266-280. <http://doi.org/10.1016/j.concog.2014.09.013>
- Dobos, G., Overhamm, T., Büssing, A., Ostermann, T., Langhorst, J., Kümmel, S., ... & Cramer, H. (2015). Integrating mindfulness in supportive cancer care: A cohort study on a mindfulness-based day care clinic for cancer survivors. *Supportive Care in Cancer*, 23, 2945-2955.  
<http://doi.org/10.1007/s00520-015-2660-6>
- Doyle, D. (1992). Have we looked beyond the physical and psychosocial? *Journal of Pain and Symptom Management*, 7, 302–311. [http://doi.org/10.1016/0885-3924\(92\)90063-N](http://doi.org/10.1016/0885-3924(92)90063-N)
- Fabbro, F., & Muratori, F. (2012). La mindfulness un nuovo approccio psicoterapeutico in età evolutive (Mindfulness: a new psychotherapeutic approach for children). *Giornale di Neuropsichiatria dell'Età Evolutiva (Italian Journal of Developmental Neuropsychiatry)*, 32, 248–59. Retrieved from <http://www.psicoterapia-palermo.it/PDFS/Mindfulness%20in%20et%C3%A0%20evolutiva.pdf>
- Fan, X., Miller, B. C., Park, K., Winward, B. W., Christensen, M., Grotevant, H. D., & Tai, R. H. (2006). An exploratory study about inaccuracy and invalidity in



adolescent self-report surveys. *Field Methods*, 18, 223-244.

<http://doi.org/10.1177/152822X06289161>

Fetzer/National Institute on Aging Working Group (1999). *Multidimensional measurement of religiousness/spirituality for use in health research: A report of the Fetzer/National Institute on Aging Working Group*. Kalamazoo, MI: Fetzer Institute.

Feuille, M., & Pargament, K. (2015). Pain, mindfulness, and spirituality: A randomized controlled trial comparing effects of mindfulness and relaxation on pain-related outcomes in migraineurs. *Journal of health psychology*, 20, 1090-1106. <https://doi.org/10.1177/1359105313508459>

Fish, J. A., Ettridge, K., Sharplin, G. R., Hancock, B., & Knott, V. E. (2014).

Mindfulness-based cancer stress management: Impact of a mindfulness-based programme on psychological distress and quality of life. *European Journal of Cancer Care*, 23(3), 413-421. <http://doi.org/10.1111/ecc.12136>

Flickstein, M. (2001). *Swallowing the River Ganges: A practice guide to the path of purification*. Somerville, MA: Wisdom Publications.

Flugel Colle, K. F., Vincent, A., Cha, S. S., Loehrer, L. L., Bauer, B. A., & Wahner-Roedler, D. L. (2010). Measurement of quality of life and participant experience with the mindfulness-based stress reduction program. *Complementary Therapies in Clinical Practice*, 16, 36-40. <http://doi.org/10.1016/j.ctcp.2009.06.008>

Garland, S. N., Carlson, L. E., Cook, S., Lansdell, L., & Speca, M. (2007). A non-randomized comparison of mindfulness-based stress reduction and healing arts programs for facilitating post-traumatic growth and spirituality in cancer

outpatients. *Supportive Care in Cancer*, 15, 949-961.

<http://doi.org/10.1007/s00520-007-0280-5>

Geary, C., & Rosenthal, S. L. (2011). Sustained impact of MBSR on stress, well-being, and daily spiritual experiences for 1 year in academic health care employees. *The Journal of Alternative and Complementary Medicine*, 17, 939-944. <http://doi.org/10.1089/acm.2010.0335>

George, L. K., Ellison, C. G., & Larson, D. B. (2002). Explaining the relationships between religious involvement and health. *Psychological Inquiry*, 13, 190-200. [http://doi.org/10.1207/S15327965PLI1303\\_04](http://doi.org/10.1207/S15327965PLI1303_04)

Germer, C. K., Siegel, R. D., & Fulton, P. R. (Eds.). (2005). *Mindfulness and psychotherapy*. New York, NY: Guilford Press.

Grabbe, L., Nguy, S. T., & Higgins, M. K. (2012). Spirituality development for homeless youth: A mindfulness meditation feasibility pilot. *Journal of Child and Family Studies*, 21, 925-937. <http://doi.org/10.1007/s10826-011-9552-2>

Greenwald, A. G., McGhee, D. E., & Schwartz, J. L. (1998). Measuring individual differences in implicit cognition: The implicit association test. *Journal of Personality and Social Psychology*, 74, 1464-1480. <http://doi.org/10.1037/0022-3514.74.6.1464>

Greeson, J. M., Smoski, M. J., Suarez, E. C., Brantley, J. G., Ekblad, A. G., Lynch, T. R., & Wolever, R. Q. (2015). Decreased symptoms of depression after mindfulness-based stress reduction: Potential moderating effects of religiosity, spirituality, trait mindfulness, sex, and age. *The Journal of Alternative and Complementary Medicine*, 21, 166-174. <http://doi.org/10.1089/acm.2014.0285>

Greeson, J. M., Webber, D. M., Smoski, M. J., Brantley, J. G., Ekblad, A. G., Suarez, E. C., & Wolever, R. Q. (2011). Changes in spirituality partly explain health-

related quality of life outcomes after mindfulness-based stress reduction. *Journal of Behavioral Medicine*, 34, 508-518.

<http://doi.org/10.1007/s10865-011-9332-x>

Gunaratana, H. (2002). *Mindfulness in plain English*. Somerville, MA: Wisdom Publications.

Hayes, A. F. (2009). Beyond Baron and Kenny: Statistical mediation analysis in the new millennium. *Communication Monographs*, 76, 408-420.

<http://doi.org/10.1080/03637750903310360>

Hayes, S. C., Strosahl, K. D., & Wilson, K. G. (1999). *Acceptance and commitment therapy: An experiential approach to behavior change*. New York, NY: Guilford Press.

Henderson, V. P., Clemow, L., Massion, A. O., Hurley, T. G., Druker, S., & Hébert, J. R. (2012). The effects of mindfulness-based stress reduction on psychosocial outcomes and quality of life in early-stage breast cancer patients: A randomized trial. *Breast Cancer Research and Treatment*, 131, 99-109.

<http://doi.org/10.1007/s10549-011-1738-1>

Hill, P. C., & Pargament, K. I. (2003). Advances in the conceptualization and measurement of religion and spirituality: Implications for physical and mental health research. *American Psychologist*, 58, 64-74.

<http://doi.org/10.1037/0003-066X.58.1.64>

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

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

- Jadad, A. R., Moore, R. A., Carroll, D., Jenkinson, C., Reynolds, D. J. M., Gavaghan, D. J., & McQuay, H. J. (1996). Assessing the quality of reports of randomized clinical trials: is blinding necessary?. *Controlled Clinical Trials*, 17, 1-12.  
[https://doi.org/10.1016/0197-2456\(95\)00134-4](https://doi.org/10.1016/0197-2456(95)00134-4)
- Jain, S., Shapiro, S. L., Swanick, S., Roesch, S. C., Mills, P. J., Bell, I., & Schwartz, G. E. (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, 11-21.  
[http://doi.org/10.1207/s15324796abm3301\\_2](http://doi.org/10.1207/s15324796abm3301_2)
- Jung, C. G. (1938). *Psychology and religion*. New Haven, CT: Yale University Press.
- 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, 33-47.  
[http://doi.org/10.1016/0163-8343\(82\)90026-3](http://doi.org/10.1016/0163-8343(82)90026-3)
- Kabat-Zinn, J. (1990). *Full catastrophe living: Using the wisdom of your body and mind to face stress, pain, and illness*. New York, NY: Delacorte.
- Kabat-Zinn, J. (1994). *Wherever you go, there you are: Mindfulness meditation in everyday life*. New York, NY: Hyperion Books.
- Kass, J. D., Friedman, R., Leserman, J., Zuttermeister, P. C., & Benson, H. (1991). Health outcomes and a new index of spiritual experience. *Journal for the Scientific Study of Religion*, 203-211. <http://doi.org/10.2307/1387214>
- 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, 1041-1056. <http://doi.org/10.1016/j.cpr.2011.04.006>

- Khoury, B., Lecomte, T., Fortin, G., Masse, M., Therien, P., Bouchard, V., ... & Hofmann, S. G. (2013). Mindfulness-based therapy: A comprehensive meta-analysis. *Clinical Psychology Review*, 33, 763-771.  
<http://doi.org/10.1016/j.cpr.2013.05.005>
- Kline, R. B. (2004). *Principles and practice of structural equation modeling* (2nd ed.). New York, NY: Guilford Press.
- Koenig, H. G. (2008). Concerns about measuring “spirituality” in research. *The Journal of Nervous and Mental Disease*, 196, 349-355.  
<http://doi.org/10.1097/NMD.0b013e31816ff796>
- Koenig, H. G. (2009). Research on religion, spirituality, and mental health: A review. *The Canadian Journal of Psychiatry*, 54, 283-291.  
<http://doi.org/10.1177%2F070674370905400502>
- Koenig, H. G., George, L. K., & Titus, P. (2004). Religion, spirituality, and health in medically ill hospitalized older patients. *Journal of the American Geriatrics Society*, 52, 554-562. <http://doi.org/10.1111/j.1532-5415.2004.52161.x>
- Kraemer, H. C., Stice, E., Kazdin, A., Offord, D., & Kupfer, D. (2001). How do risk factors work together? Mediators, moderators, and independent, overlapping, and proxy risk factors. *American Journal of Psychiatry*, 158, 848-856.  
<http://doi.org/10.1176/appi.ajp.158.6.848>
- Kristeller, J. L. (2010). Spiritual engagement as a mechanism of change in mindfulness- and acceptance-based therapies. In R. A. Baer (Ed.), *Assessing mindfulness and acceptance processes in clients: Illuminating the theory and practice of change* (pp. 155–184). Oakland, CA: New Harbinger.
- Labelle, L. E., Lawlor-Savage, L., Campbell, T. S., Faris, P., & Carlson, L. E. (2015). Does self-report mindfulness mediate the effect of mindfulness-based stress

reduction (MBSR) on spirituality and posttraumatic growth in cancer patients?. *The Journal of Positive Psychology*, 10, 153-166.

<http://doi.org/10.1080/17439760.2014.927902>

Larson, D.B., Swyers, J.P., & McCullough, M.E. (Eds.). (1998). *Scientific research on spirituality and health: A consensus report*. Rockville, MD: National Institute for Healthcare Research.

Lazaridou, A., & Pentaris, P. (2016). Mindfulness and spirituality: Therapeutic perspectives. *Person-Centered & Experiential Psychotherapies*, 15, 235-244.

<http://doi.org/10.1080/14779757.2016.1180634>

Lee, V. (2008). The existential plight of cancer: Meaning making as a concrete approach to the intangible search for meaning. *Supportive Care in Cancer*, 16, 779-785. <http://doi.org/10.1007/s00520-007-0396-7>

Leigh, J., Bowen, S., & Marlatt, G. A. (2005). Spirituality, mindfulness and substance abuse. *Addictive Behaviors*, 30, 1335-1341.

<http://doi.org/10.1016/j.addbeh.2005.01.010>

Lengacher, C. A., Johnson-Mallard, V., Barta, M., Fitzgerald, S., Moscoso, M. S., Post-White, J., ... & Goodman, M. (2011). Feasibility of a mindfulness-based stress reduction program for early-stage breast cancer survivors. *Journal of Holistic Nursing*, 29, 107-117. <http://doi.org/10.1177/0898010110385938>

Linehan, M. (1993). *Cognitive-behavioral treatment of borderline personality disorder*. New York, NY: Guilford Press.

Mackenzie, M. J., Carlson, L. E., Munoz, M., & Speca, M. (2007). A qualitative study of self-perceived effects of mindfulness-based stress reduction (MBSR) in a psychosocial oncology setting. *Stress and Health*, 23, 59-69.

<http://doi.org/10.1002/smi.1120>

- Mawani, A., Rashid, S., Verrier, M. J., Dick, B. D. (2014). The effect of mindfulness meditation on pain and spirituality in patients with chronic non-cancer pain. *Journal of Pain Management*, 7, 75-82. Retrieved from <http://search.proquest.com/openview/4a541864030270993caa917c91d2b0a0/1?pq-origsite=gscholar&cbl=2034829>
- Merlin, T., Weston, A., Tooher, R., Middleton, P., Salisbury, J., & Coleman, K. (2009). NHMRC levels of evidence and grades for recommendations for developers of guidelines. National Health and Medical Research Council (NHMRC). Canberra, ACT: Australian Government.
- Miller, W. R., & Thoresen, C. E. (2003). Spirituality, religion, and health: An emerging research field. *American Psychologist*, 58, 24. <http://doi.org/10.1037/0003-066X.58.1.24>
- Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., & Prisma Group. (2009). Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *PLoS Med*, 6, e1000097. <http://doi.org/10.1371/journal.pmed.1000097>
- Monod, S., Brennan, M., Rochat, E., Martin, E., Rochat, S., & Büla, C. J. (2011). Instruments measuring spirituality in clinical research: A systematic review. *Journal of General Internal Medicine*, 26, 1345-1357. <http://doi.org/10.1007/s11606-011-1769-7>
- Nilsson, H., & Kazemi, A. (2016). Reconciling and thematizing definitions of mindfulness: The big five of mindfulness. *Review of General Psychology*, 20, 183. <http://doi.org/10.1037/gpr0000074>
- O'Collins, G., & Farrugia, E. G. (1991). *A concise dictionary of theology*. New York: Paulist Press.

- Offenbächer, M., Sauer, S., Hieblinger, R., Hufford, D. J., Walach, H., & Kohls, N. (2011). Spirituality and the international classification of functioning, disability and health: Content comparison of questionnaires measuring mindfulness based on the international classification of functioning. *Disability and Rehabilitation*, 33, 2434-2445. <http://doi.org/10.3109/09638288.2011.573902>
- Oman, D., Shapiro, S. L., Thoresen, C. E., Flinders, T., Driskill, J. D., & Plante, T. G. (2007). Learning from spiritual models and meditation: A randomized evaluation of a college course. *Pastoral Psychology*, 55, 473-493. <http://doi.org/10.1007/s11089-006-0062-x>
- Pargament, K. I. (1997). *The psychology of religion and coping: Theory, research, and practice*. New York, NY: Guilford Press.
- Pepping, C. A., Walters, B., Davis, P. J., & O'Donovan, A. (2016). Why do people practice mindfulness? An investigation into reasons for practicing mindfulness meditation. *Mindfulness*, 7, 542-547. <http://doi.org/10.1007/s12671-016-0490-3>
- Peterman, A. H., Fitchett, G., Brady, M. J., Hernandez, L., & Cella, D. (2002). Measuring spiritual well-being in people with cancer: The functional assessment of chronic illness therapy-spiritual well-being scale (FACIT-Sp). *Annals of Behavioral Medicine*, 24, 49-58. [http://doi.org/10.1207/S15324796ABM2401\\_06](http://doi.org/10.1207/S15324796ABM2401_06)
- Podsakoff, P. M., & Organ, D. W. (1986). Self-reports in organizational research: Problems and prospects. *Journal of Management*, 12, 531-544. <http://doi.org/10.1177/014920638601200408>
- Rahner, K., & Vorgrimler, H. (1981). *Dictionary of theology*. New York: Crossroad.



- Roberts, L. R., & Montgomery, S. B. (2015). Mindfulness-based intervention for perinatal grief after stillbirth in rural India. *Issues in Mental Health Nursing*, 36, 222-230. <http://doi.org/10.3109/01612840.2014.962676>
- Rojjani, R., Santoyo, J. F., Rahrig, H., Roth, H. D., & Britton, W. B. (2017). Women benefit more than men in response to college-based meditation training. *Frontiers in Psychology*, 8, 551. <http://doi.org/10.3389/fpsyg.2017.00551>
- Scott, A. B. (1997). Categorizing definitions of religion and spirituality in the psychological literature: A content analytic approach. Unpublished manuscript.
- Segal, Z. V., Williams, J. M. G., & Teasdale, J. D. (2002). *Mindfulness-based cognitive therapy for depression: A new approach to preventing relapse*. New York, NY: Guilford Press.
- Shapiro, S. L., Carlson, L. E., Astin, J. A., & Freedman, B. (2006). Mechanisms of mindfulness. *Journal of Clinical Psychology*, 62, 373-386. <http://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, 581-599. <http://doi.org/10.1023/A:1018700829825>
- Sin, N. L., & Lyubomirsky, S. (2009). Enhancing well-being and alleviating depressive symptoms with positive psychology interventions: A practice-friendly meta-analysis. *Journal of Clinical Psychology*, 65, 467-487. <https://doi.org/10.1002/jclp.20593>
- Strang, P. (1997). Existential consequences of unrelieved cancer pain. *Palliative Medicine*, 11, 299-305. <http://doi.org/10.1177/026921639701100406>

- Sulmasy, D. P. (2002). A biopsychosocial-spiritual model for the care of patients at the end of life. *The Gerontologist*, 42, 24-33.  
[http://doi.org/10.1093/geront/42.suppl\\_3.24](http://doi.org/10.1093/geront/42.suppl_3.24)
- Tacón, A. M. (2011). Mindfulness: Existential, loss, and grief factors in women with breast cancer. *Journal of Psychosocial Oncology*, 29, 643-656.  
<http://doi.org/10.1080/07347332.2011.615382>
- Tamagawa, R., Speca, M., Stephen, J., Pickering, B., Lawlor-Savage, L., & Carlson, L. E. (2015). Predictors and effects of class attendance and home practice of yoga and meditation among breast cancer survivors in a mindfulness-based cancer recovery (MBCR) program. *Mindfulness*, 6, 1201-1210.  
<http://doi.org/10.1007/s12671-014-0381-4>
- Thoresen, C. E., & Harris, A. H. (2002). Spirituality and health: What's the evidence and what's needed?. *Annals of Behavioral Medicine*, 24, 3-13.  
[http://doi.org/10.1207/S15324796ABM2401\\_02](http://doi.org/10.1207/S15324796ABM2401_02)
- Underwood, L. G., & Teresi, J. A. (2002). The daily spiritual experience scale: Development, theoretical description, reliability, exploratory factor analysis, and preliminary construct validity using health-related data. *Annals of Behavioral Medicine*, 24, 22-33.  
[http://doi.org/10.1207/S15324796ABM2401\\_04](http://doi.org/10.1207/S15324796ABM2401_04)
- Weisman, A. D., & Worden, J. W. (1977). The existential plight in cancer: significance of the first 100 days. *The International Journal of Psychiatry in Medicine*, 7, 1-15. <http://doi.org/10.2190/UQ2G-UGV1-3PPC-6387>
- Williams, J. M. G., & Kabat-Zinn, J. (2011). Mindfulness: Diverse perspectives on its meaning, origins, and multiple applications at the intersection of science and

dharma. *Contemporary Buddhism*, 12, 1-18.

<http://doi.org/10.1080/14639947.2011.564811>

Würtzen, H., Dalton, S. O., Christensen, J., Andersen, K. K., Elsass, P., Flyger, H. L., ... & Johansen, C. (2015). Effect of mindfulness-based stress reduction on somatic symptoms, distress, mindfulness and spiritual wellbeing in women with breast cancer: Results of a randomized controlled trial. *Acta Oncologica*, 54, 712-719. <http://doi.org/10.3109/0284186X.2014.997371>

*Oncologica*, 54, 712-719. <http://doi.org/10.3109/0284186X.2014.997371>

Zernicke, K. A., Campbell, T. S., Blustein, P. K., Fung, T. S., Johnson, J. A., Bacon, S. L., & Carlson, L. E. (2013). Mindfulness-based stress reduction for the treatment of irritable bowel syndrome symptoms: A randomized wait-list controlled trial. *International Journal of Behavioral Medicine*, 20, 385-396.

<http://doi.org/10.1007/s12529-012-9241-6>

Zernicke, K. A., Campbell, T. S., Speca, M., McCabe-Ruff, K., Flowers, S., & Carlson, L. E. (2014). A randomized wait-list controlled trial of feasibility and efficacy of an online mindfulness-based cancer recovery program: The eTherapy for cancer applying mindfulness trial. *Psychosomatic Medicine*, 76, 257-267. <http://doi.org/10.1097/PSY.0000000000000053>

<http://doi.org/10.1097/PSY.0000000000000053>

Zernicke, K. A., Campbell, T. S., Speca, M., Ruff, K. M., Flowers, S., Tamagawa, R., & Carlson, L. E. (2016). The eCALM trial: eTherapy for cancer applying mindfulness. Exploratory analyses of the associations between online mindfulness-based cancer recovery participation and changes in mood, stress symptoms, mindfulness, posttraumatic growth, and spirituality. *Mindfulness*, 7, 1071-1081. <http://doi.org/10.1007/s12671-016-0545-5>

<http://doi.org/10.1007/s12671-016-0545-5>

Zinnbauer, B. J. (1997). Capturing the meanings of religiousness and spirituality: One way down from a definitional Tower of Babel. Unpublished doctoral dissertation, Bowling Green State University

Zinnbauer, B. J., Pargament, K. I., Cole, B., Rye, M. S., Butter, E. M., Belavich, T. G., Hipp, K. M., Scott, A. B., & Kadar, J. L. (1997). Religion and spirituality: Unfuzzifying the fuzzy. *Journal for the Scientific Study of Religion*, 36, 549–564. <http://doi.org/10.2307/1387689>

Zinnbauer, B. J., Pargament, K. I., & Scott, A. B. (1999). The emerging meanings of religiousness and spirituality: Problems and prospects. *Journal of personality*, 67, 889-919. <http://doi.org/10.1111/1467-6494.00077>

## **SECTION B**

Samuel D. Landau

**The ‘myth’ of mindfulness-based interventions: a randomised  
comparison of the effect of secular vs spiritual role-inductions on  
credibility and outcomes**

7937 words (+731)

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## **Abstract**

Mindfulness meditation (MM) is an ancient Buddhist spiritual practice that has been secularised into popular and effective therapeutic interventions. This is the first empirical study to investigate the spiritual and secular context of mindfulness-based interventions through the prism of common factors theory, specifically focusing on the work of Jerome Frank and the concept of a healing 'myth' or story. The hypotheses predicted that a philosophically integrated role-induction to MM, would be more effective at improving credibility and expectations, state mindfulness and affect outcomes compared to philosophically narrower spiritual or secular presentations. Participants were randomly allocated to a role-induction group (integrated / spiritual / secular) and all received the same MM-intervention. Additionally, congruency effects between participants' dispositional spirituality/secularity and induction group were tested. One hundred and sixty-five participants (82 % female, mean age 25 years, SD=11.15) completed the online study. While all groups showed improvements on measures of credibility and expectations, state mindfulness and negative affect across timepoints, contrary to hypotheses the integrated induction group did not improve more than the secular or spiritual groups, nor were strong congruency effects found. Results are discussed in the context of a possible primary 'myth' of MM that overrides secondary divisions between secularity/spirituality; the 'myth' of finding peace in a frantic world.

### **Keywords:**

Mindfulness: Meditation; Spirituality; Secularity; Role-induction

## Introduction

Mindfulness meditation (MM) has seen a substantial increase in its therapeutic application and scientific examination in recent years (Crane et al., 2017; Williams & Kabat-Zinn, 2011). 'Mindfulness' may refer to a psychological trait, a state of awareness, a practice of cultivating mindfulness (e.g. MM), or a psychological process (Germer, Siegel, & Fulton, 2005). The intended meanings of 'mindfulness' will be clarified throughout this study (Chambers, Gullone, & Allen, 2009). One of the most commonly cited definitions of mindfulness is the awareness that arises through "paying attention in a particular way: on purpose, in the present moment, and nonjudgmentally" (Kabat-Zinn, 1994, p. 4). Descriptions of mindfulness provided by most other researchers are similar (Keng, Smoski, & Robins, 2011).

MM originates from an ancient Buddhist spiritual tradition (Bhikkhu, 1979; Williams & Kabat-Zinn, 2011). The secularisation and application of MM as an intervention for clinical problems was popularised via the work of Kabat-Zinn who used MM to help people experiencing chronic pain (Kabat-Zinn, 1982) in a programme now known as mindfulness-based stress reduction (MBSR; Kabat-Zinn, 1990). Since the establishment of MBSR, several other mindfulness-based interventions (MBIs) have been developed, including mindfulness-based cognitive therapy (MBCT; Segal, Williams, & Teasdale, 2002), dialectical behaviour therapy (DBT; Linehan, 1993) and acceptance and commitment therapy (ACT; Hayes, Strosahl, & Wilson, 1999). MBIs are increasing in their popularity (Baer, 2003) and demonstrate a broad array of positive outcomes (e.g. Khoury et al., 2013). MBIs are defined as being 'informed by theories and practices that draw from a confluence of contemplative traditions, science, and the major disciplines of medicine, psychology

and education...[and] draw on aspects of these (contemplative) traditions while leaving behind their religious, esoteric and mystical elements' (Crane et al., 2017).

### **Mechanisms of change in MM**

Consideration has been given to mechanisms of change within MM to explain the positive outcomes of MBIs. Shapiro, Carlson, Astin and Freedman (2006) conceptualised the IAA model to describe the three axioms of mindfulness, referring to; Intention (to want to achieve something from mindfulness practice), Attention (to draw one's attention to the present moment), and Attitude (to relate with self-compassion to one's thoughts and experiences). They proposed a process of 'reperceiving' (a fundamental change in relationship to experience) as a meta-mechanism by which increased mindfulness from MBI participation achieves positive change. Reperceiving was suggested to lead to changes in four sub-mechanisms: a) self-regulation, b) emotional, behavioural and cognitive flexibility, c) values clarification, d) exposure, which in turn would result in positive outcomes (Shapiro et al., 2006). An empirical examination and mediation analysis of Shapiro et al.'s model (2006) found that while there were improvements in measures of the four sub-mechanisms from pre- to post- MBI, analyses did not support the mediating effect of changes in reperceiving on the relationship of mindfulness with those four variables (Carmody, Baer, Lykins, & Olendzki, 2009). Nevertheless, further analyses revealed that measures of reperceiving were highly associated with measures of mindfulness itself, suggesting that they may be overlapping constructs. When mindfulness and reperceiving measures were combined into a single variable, partial support was found for the mediating effect of the four sub-mechanisms on wellbeing outcomes (Carmody et al., 2009).



In line with the suggested mechanism of re-perceiving, it was found that reductions in depressive symptoms following MBCT were associated with changes in the interpretation of cognitive reactivity (Kuyken et al., 2010). Others have suggested four mechanisms by which MBIs achieve positive outcomes; 1. Attention regulation, 2. Body awareness, 3. Emotional regulation, 4. Change in perspective on the self, based on a conceptual and neuroscientific review of extant literature (Hölzel et al., 2011).

Unfortunately, there is currently little empirical evidence to support these mechanism/s as being a) the primary drivers of change in MBIs, b) to individuate these processes as being uniquely offered by MBIs as opposed to other interventions. Theoretically, it is also difficult to 'join the dots' from models to meta-mechanisms to sub-mechanisms without recourse to further implicit processes occurring. Moreover, these theoretical positions have generally arisen from a-priori top-down perspectives as opposed to inductive consultation with MM experts, MBI participants and analysis of mindfulness writings. Nevertheless, while the literature on mechanisms has at least considered the role of increased mindfulness following a MBI in achieving positive outcomes, the role of increased spirituality following a MBI has only relatively recently been given significant empirical consideration (e.g. Carmody, Reed, Kristellar & Merriam, 2008).

### **Spirituality and MBIs**

A variety of definitions of spirituality are held by scholars, lay-people and psychologists (Zinnbauer, Pargament & Scott, 1999). For example, spirituality has been defined by reference to a relationship with God / a Higher Power that affects one's behaviour (Armstrong, 1995), an inner need for self-transcendence and finding

oneself (Benner, 1989), an existential search for meaning (Doyle, 1992) and a set of prescriptive spiritual practices, such as prayer devotions (O'Collins & Farrugia, 1991).

Nevertheless, a scientific consensus regarding operational definitions of spirituality has been found on one level; this is a complex construct (e.g. Larson, Swyers, & McCullough, 1998; Pargament, 1997). Spirituality is neither dichotomous (a quality that is either present or absent) nor a single linear dimension (a quality that one has more or less of). Rather, spirituality can be conceptualised as a multidimensional latent construct; a conceptual underlying entity that is not observed directly but can be inferred from observations of some of its component dimensions (Miller & Thoresen, 2003). Thus, this project will use the following influential definition, that spirituality can be defined as the internal, personal, and private manifestation of the sacred (Hill & Pargament, 2003), measured primarily by multi-dimensional self-report variables, that include items regarding spiritual well-being, peace and comfort derived from faith, spiritual connectedness, and spiritual coping (Cotton et al., 2006).

Spiritual engagement has been suggested as a fundamental change mechanism in MBIs (Kristeller, 2010). There is an emerging literature that shows correlations between state and trait mindfulness, measures of spirituality and positive outcomes (e.g. Bussing et al., 2012; Einolf, 2013; Shorey, Gawrysiak, Anderson, & Stuart, 2015; Lazaridou & Pentaris, 2016). Several RCTs demonstrate that even secular MBIs result in increases in spirituality (e.g. Carlson et al., 2016; Shapiro, Schwartz, & Bonner, 1998), and that these increases mediate some of the effects of mindfulness on wellbeing (e.g. Carmody, et al., 2008; Greeson et al., 2011). A recent

meta-analysis found strong and consistent evidence for secular MBIs increasing measures of self-reported spirituality (see Part A of this thesis).

Researchers have questioned whether spirituality is a critical ingredient to the efficacy of meditation interventions. Wachholtz and Pargament (2005) created spiritual and secular variants of transcendental meditation (TM), one using repeated spiritual phrases (e.g. 'God is good', 'God is joy') and another using repeated non-spiritual phrases (e.g. 'I am good', 'I am joyful'). Participants were randomly assigned to either the spiritual TM, secular TM or control relaxation group and attended a single taught session followed by two weeks of home practice. The spiritual meditation group had greater decreases in self-reported anxiety and more positive mood, spiritual health, and spiritual experiences than the other two groups. They also tolerated pain almost twice as long as the other two groups (Wachholtz & Pargament, 2005). The authors interpret the superiority of spiritual TM by suggesting that even though secularised TM does not contain explicit spiritual references it is still an implicitly spiritual process, as evidenced by the finding that even the secular TM group reported greater spiritual experiences following the intervention, concluding that 'secular meditation tasks represent 'less-spiritually oriented, rather than non-spiritually oriented, meditation tasks' (Wachholtz & Pargament, 2005).

A likewise comparison of spiritual and secular TM for migraineurs found that spiritual TM was more effective in reducing migraine headaches than secular TM (Wachholtz & Pargament, 2008). Similarly, a comparison of wellbeing interventions for patients with metastatic melanoma that differed in their use of overtly spiritual material found that the spiritual meditation group showed greater improvements in affect and mood compared to a secular relaxation condition or treatment as usual (Cole et al., 2012). Furthermore, a comparison of a home study-based spirituality

education programme with a secular mindfulness stress reduction course, for emotionally distressed individuals, found that participants in the spirituality programme showed greater improvements on several measures of wellbeing compared to the mindfulness group (Moritz et al., 2006).

However, in contrast to the findings above, when comparing a standard secular MBI to a spiritualised MBI (with the inclusion of such references as 'coming closer to God' and 'experiencing the spirit') no difference in outcomes on a cold-pressor task or migraines were found between the two MBI groups compared to a control (Feuille & Pargament, 2015). Similarly, the secularised practice of Naikan, a contemplative practice originating in Shin Buddhism, achieves similar outcomes to its spiritual/religious original (Ozawa de-Silva & Ozawa de-Silva, 2010). The authors cite a number of possible issues to explain why spiritualised TM was superior to its secular analogue while spiritualised MM was not. It may be that owing to differences between MM and TM, TM was more amenable to including overt and salient spiritual phrases, or that mantra-based meditation, such as TM, was more suitable to the shorter interventions presented in these studies. TM's greater suitability as a brief intervention may have also resulted in spiritual expectations being more easily met in the spiritual TM groups than spiritual MBI ones (Feuille & Pargament, 2015).

A popular debate regarding MBIs is whether they can be ethically or effectively separated from their religious/spiritual/Buddhist originating context (e.g. Grossman, 2011; Brazier, 2013; Harrington & Pickles 2009). Another approach is to consider mindfulness as an inherent human capacity that can be practiced outside of any one specific faith tradition (Brown, Ryan, Loverich, Biegel, & West, 2011). The spiritual components of secular MBIs are often not stressed, with MBIs deployed in multiple secular settings such as the workplace, schools, prisons and healthcare

(Pepping, Walters, Davis, & O'Donovan, 2016). Many participants consider the secular stance of MBIs to facilitate the exploration of spirituality in an unthreatening way (Mackenzie, Carlson, Munoz, & Speca, 2007). While earlier research evaluated whether manipulating the content of MM to be more or less spiritual altered outcomes (Feuille & Pargament, 2015), there is little evidence considering effects of manipulating the spiritual/secular context that MBIs are presented in. The Introduction will now consider why a MBI's explicitly presented context and associated expectation and credibility effects are theoretically and therapeutically important.

### **'Myth' and 'ritual': Context, credibility and expectations**

A significant debate exists regarding the relative efficacy of different psychotherapies arising from the 'equivalence paradox'; the finding from meta-analyses that overall all bona fide psychotherapies have roughly similar positive outcomes (Cuijpers, 2017; Stiles, Shapiro & Elliot, 1986; Duncan, Miller, Wampold, & Hubble, 2010). In order to explain this finding, theorists have suggested that the elements of psychotherapies that are common across modalities are the primary drivers of change, as opposed to modality-specific factors; giving rise to common factors (CF) theory (Duncan et al., 2010; Wampold et al., 1997; Wampold, 2012). An oft-examined common factor is the therapeutic alliance (Bordin, 1979) which is one of the best predictors of therapeutic outcome (Duncan et al., 2010). Others favour a position of empirically supported therapies (EST), stating that the specific procedures of a psychotherapy are the primary agent of change (Roth & Fonagy, 1996), arguing for both treatment and disorder specificity (Laska, Gurman, & Wampold, 2014). EST proponents take issue with the evidence supporting CF theory by considering the 'homogeneity myth' of

meta-analyses (Beutler, 2002), while demonstrating evidence of specific treatments offering superior outcomes for specific problems, e.g. CBT for generalised anxiety disorder (Beutler, 2002). While intervention-specific mechanisms of MBIs have been given empirical and theoretical consideration, much less literature considers MBIs from a CF theory perspective.

Jerome Frank (1973), an influential CF theorist suggested that all therapies are comprised of a healing ‘myth’ or story. The ‘myth’ is devised by the therapist, based on the therapeutic modality employed, to provide a plausible explanation of the client’s problem to help them make sense of the world and their challenges. The ‘myth’ provides the rationale or context underlying the intervention’s approach. Change may occur via three avenues: connectedness (the feeling that the client is supported by the therapist), expectations (client is ‘remoralised’ (Frank, 1973) to believe that change is possible), and mastery (therapy gives ‘ritual’ to the ‘myth’ (Frank, 1973) – i.e. therapy results in change actions). Frank (1973) suggested that the ‘ritual’ of therapy must match the ‘myth’; the therapy must credibly fit the story (Borkovec and Nau, 1972).

The perceived credibility of a therapeutic intervention, as well as expectation for improvement following therapy, are important determinants of therapy outcome (Borkovec & Nau, 1972; Greenberg, Constantino, & Bruce, 2006), including expectations of benefit from MBSR (Greeson et al., 2011). One can manifest credibility and expectations for an intervention via role-induction, that is presenting the context, rationale or ‘myth’ (Frank, 1973) of therapy (Walitzer, Dermen, & Connors, 1999). Accordingly, if a person can be induced to a plausible role (or accept the ‘myth’ of the intervention), they may experience heightened credibility and expectations, improving the likelihood of helpful therapeutic results. Secular MBIs

must balance accessibility to a largely secular Western society on the one hand, with integrity to their spiritual Buddhist origins on the other (Marx, 2015).

Considering the notion of MBI accessibility (Marx, 2015) offers an additional possibility to explain the divergence in findings between TM (in which spiritualised TM generated superior outcomes to secularised TM; Wachholtz & Pargament, 2005) and MM (in which no differences in outcomes were found between secularised and spiritualised MM; Feuille & Pargament, 2015), described above. The authors considered this divergence as an aberration; offering experimental or manipulation limitations as explanators while retaining their theoretical premise that both TM and MM are essentially spiritual techniques that become diluted when divorced from their spiritual context, thereby being less able to fulfil individuals' spiritual expectations (Feuille & Pargament, 2015). However, it may be that there is a more fundamental difference between secularised TM and secularised MM, at least in the 'myth' that they present. Owing to the widespread propagation and popularisation of MBIs, it may be that secular MBIs have been sufficiently secularised and normalised within society to not be less-spiritually oriented meditation tasks, as was suggested for a secular TM-intervention (Wachholtz & Pargament, 2005). Instead, MBIs may be secular meditation tasks, such that the 'myth' of a secular MBI is roughly as credible to a random group of people as that of a spiritual MBI. That is, assuming the group of people are normally distributed in their dispositional spirituality/secularity, they would on average find a secular 'myth' as credible and accessible as a spiritual one; both contexts would appeal to a similar amount of more spiritually or more secularly disposed people. Indeed, the neural activity resulting from mindfulness practice is distinct from that resulting from spiritual practice (Barnby, Bailey, Chambers & Fitzgerald, 2015). These two possible explanations differ theoretically on their

conceptualisation of the 'myth' of a secular MBI as to whether it is primarily spiritual or secular.

MBIs integrate both Eastern (spiritual) and Western (secular) philosophies (Kabat-Zinn, 2003), perhaps resulting in a broad spiritual and secular 'myth' base. As such, MBIs may be particularly effective in allowing an individual to locate their dispositional 'myth' preferences, be they spiritual or secular, within the 'myth' of the intervention. If individuals are more responsive to the broad 'myth' of a MBI, this may in turn result in greater expectation effects and so greater likelihood of receptivity to the 'ritual' of MM practice.

This study focused on credibility and expectations arising from the context that a MBI is presented in as CFs that link the 'myth', or rationale for a MBI, to the 'ritual' of MM practice. Combining the findings that MBIs increase spirituality and that changes in spirituality may mediate some of the effects of mindfulness on wellbeing (see Part A of this thesis) with the theoretical concerns for the integrity of MBIs (Marx, 2015), one could hypothesise that reinstating some of a MBI's spiritual context, or 'myth', might be beneficial. Alternatively, it might be argued that in Western healthcare settings, a secular, scientific context may be more generally acceptable and credible. A third possibility might be that broadly speaking, a philosophically integrated context that incorporates both spiritual and secular elements might be most effective in maximising expectations for the broadest swathe of people, be they more spiritually or secularly disposed. This last possibility seems to be most compelling; individuals' preferences for therapy have been found to correlate with expectations for therapeutic effectiveness (Wanigaratne & Barker, 1995). Indeed, a recent moderator analysis of data from a large RCT of a MBI for cancer survivors found that participants who were allocated to their preferred



treatment experienced greater improvements in wellbeing than those allocated to their non-preferred treatment (Carlson et al., 2014). Meeting more participants' preferences through a philosophically integrated approach might therefore be the most effective context for presenting a MBI. Finally, perhaps there are individual differences, with a context that is most congruent with a person's existing outlook (spiritual or secular) the most effective in improving credibility and expectations. These possibilities have not yet been empirically tested.

Therefore, this study manipulated role-induction to prime either the (1) secular (Western/science-based), (2) spiritual (Buddhist-derived), or (3) philosophically-integrated nature of MM, after which all participants received a brief MBI. Effects on post-induction and post-intervention self-reported credibility and expectations, state mindfulness and affect outcomes were measured. To the author's knowledge this is the first empirical study to consider the context of MBIs through the prism of CF approaches. Finally, individual differences for participants' dispositional spirituality and secularity were contrasted against congruent/incongruent group allocation to determine if dispositional preferences interact with the likelihood of accepting the 'myth' of therapy. It may be that congruency between spiritually/secularly disposed individuals and a spiritually/secularly presented intervention allows for higher ratings of credibility and expectations as well as greater improvements on outcomes.

### **Study aims and hypotheses:**

The aim of this study is to compare the efficacy of different induction groups, and effects of individual disposition, on expectations, credibility and outcomes for a MBI.

There are two main research questions:

1. Which role-induction (spiritual/secular/integrated) is more effective in improving expectations, credibility and mindfulness outcomes in relation to a brief mindfulness intervention?

Hypothesis 1:

The integrated role-induction would result in a) greater improvements in credibility and expectations post-induction, and b) superior state mindfulness and affect outcomes post-intervention compared to the spiritual / secular induction groups. This is because the integrated induction has the broadest philosophical base and therefore should appeal to the preferences of more participants (Carlson et al., 2014) than the narrower secular or spiritual approaches. This hypothesis assumes that more positive expectations of, and credibility for, a mindfulness intervention would predict improved outcomes following the intervention.

2. Do individual differences interact with the type of induction as evidenced by differences in credibility, expectations or outcomes?

Hypothesis 2:

Participants whose dispositional preferences are congruent with group allocation (e.g. secular participants in the secular role-induction group) would rate credibility and expectations higher and demonstrate better outcomes compared to participants who are allocated to an induction that is incongruent with their dispositional preferences (e.g. secular participants in the spiritual role-induction group).

## Method

### Participants

The study was conducted between December 2016 and March 2017. Participants were recruited opportunistically from social media, email requests and from a large urban university's subject pool. Participants were eligible for the study if they were aged over 18 years. Statistical power analysis using G\*Power (version 3; Faul, Erdfelder, Lang, & Buchner, 2007) suggested a participant number of at least 152 to achieve a power of 0.80 with an alpha of 0.05. Recruitment ended a week after the target number of study completers was achieved.

Of 233 people who initiated the study online, 165 completed the final measures. The sample was mostly women  $n=135$  (81.8%), men  $n=27$  (16.4%), no fixed gender  $n=2$  (1.2%), other  $n=1$  (0.6%) with a mean age of 25.0 years ( $SD=11.15$ ). See Table 1 for further demographic information. Categories for demographics were based upon UK census categories and The Royal Free Interview for Spiritual and Religious Beliefs (King, Speck & Thomas, 2001).

**Table 1**

Demographic information and distribution for study sample ( $n=165$ ).

<b>Demographic</b>	<b>n (%)</b>
<b>Ethnicity</b>	
White	103 (62.4)
Black / African / Caribbean / Black British	5 (3.0)
Mixed / Multiple ethnic groups	10 (6.1)
Asian / Asian British	42 (25.5)
Other	5 (3.0)
<b>Highest level of academic achievement</b>	
GCSE / equivalent	3 (1.8)

A level / equivalent	99 (60.0)
Bachelor's degree	32 (19.4)
Master's degree	27 (16.4)
Doctoral degree	4 (2.4)
<b>Employment status</b>	
Employee - part time	16 (9.7)
Employee - full time	23 (13.9)
Self-employed	3 (1.8)
Unemployed	6 (3.6)
Full-time student	117 (70.9)
<b>Religion</b>	
Atheist (no religion)	56 (33.9)
Agnostic (not sure)	43 (26.1)
Church of England / Anglican	7 (4.2)
Roman Catholic	5 (3.0)
Protestant	4 (2.4)
Other Christian	7 (4.2)
Shi'ite Muslim	1 (0.6)
Sunni Muslim	10 (6.1)
Jew	14 (8.5)
Hindu	3 (1.8)
Sikh	2 (1.2)
Buddhist	8 (4.8)
Other	5 (3.0)

## Design

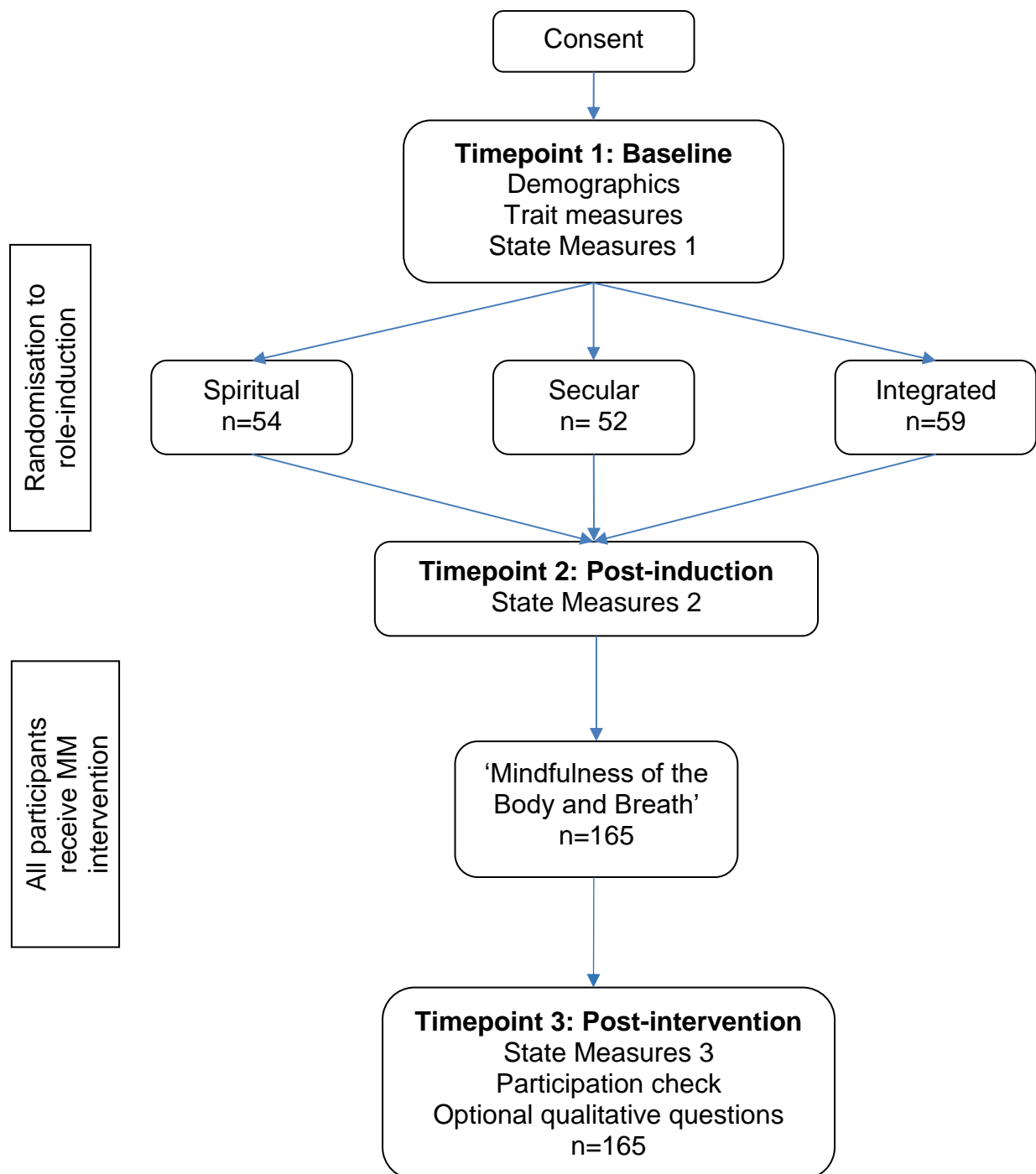
The study used a 3x3 experimental design with between group factors of role-induction group (integrated/secular/spiritual) and repeated measures of assessment timepoint (baseline/post-induction/post-intervention). The study was delivered online using Qualtrics (Qualtrics, Provo, UT; <http://www.qualtrics.com>) with embedded YouTube videos of the induction and intervention. It contained several demographic, trait and state measures, together with two intervention points; 1) induction video to MM, 2) intervention video of typical MM practice. The programme did not let participants advance in the study until all fields were completed and so there were no

missing data. Participants accessed the study on their own computers or internet enabled devices.

The independent variables were group assignment (three levels: spiritual/secular/integrated), baseline trait measures (mindfulness, spirituality, secularity) and time-point (three levels: baseline/post-induction/post-intervention). The dependent variables were the state measures (credibility and expectations, affect, mindfulness).

## **Procedure**

For a schematic of study flow, see Figure 1; for a copy of the online materials, see Appendix 1. Participants began by granting informed consent and recording any previous experience of meditation. They then progressed to pre-measures: demographic (age, gender, ethnicity, academic achievement, religion), trait (mindfulness, spirituality, secularity) and baseline state (credibility and expectations, affect, mindfulness). Following pre-measures, participants were randomly assigned by the online programme via a random number generator to one of three role-induction groups (spiritual (n=54)/secular (n=52)/integrated (n=59)) after which the state measures were repeated. All participants then viewed the MM video and again completed the state measures. Final participation checks and optional qualitative questions concluded the experiment. All participants were offered free entry to a prize draw as a 'thank you' for participation. UCL students were additionally offered course credit in partial fulfilment of course requirements. The programme lasted approximately 45 minutes.



**Figure 10.** Schematic of study flow

### Induction and intervention videos

The induction videos lasted approximately six minutes each and were created by the author using Windows Movie Maker. They consisted of a spoken script alongside a flow of images that enhanced and matched the script’s content. The scripts were

selected from passages in the popular book, *Mindfulness: a practical guide to finding peace in a frantic world* (Williams & Penman, 2011), see Appendix 1.2. This text was selected owing to its broad appeal and accessible language.

Sections of text that focused on either the spiritual or secular/scientificall-based aspects of MBIs were selected and matched in length, generating the spiritual and secular scripts. The integrated script was created by combining passages of equal length from both scripts to generate a hybrid of equal length to the originals. As all the script material was written by the same authors, as well as matched in length, we deemed them to be sufficiently equivalent in tone and salience for the manipulation.

An example from the spiritual script:

[The happiness resulting from MM is] a secret that was well understood in the ancient world and kept alive in some cultures even today. But many of us in the Western world have largely forgotten how to live a good and joyful existence

An example from the secular script:

Clinical trials show that it (MM) works. It's been clinically proven to halve the risk of depression in those who have suffered the most debilitating forms of this illness'

The MM intervention video was 'Mindfulness of the Body and Breath' (Williams & Penman, 2011) from the same popular book, see Appendix 1.3. This was an eight-minute audio track within YouTube that guided participants through the MM stages of settling, bringing awareness to the body, focusing on sensations of breathing and dealing skilfully with mind-wandering.

## Measures

All measures were either freely available or permission for their use was granted by the original authors. Full copies can be found in Appendix 1.1. Internal consistency for all baseline measures in the current study is displayed in Table 2.

### **Five Facet Mindfulness Questionnaire – Short Form (FFMQ-SF)**

(Bohlmeijer, ten Klooster, Fledderus, Veehof, & Baer, 2011), based upon full FFMQ, (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006). This 24-item questionnaire measures trait mindfulness and uses five subscales corresponding to five-facets in the mindfulness construct: observing, describing, acting with awareness, non-judging of inner experience, and non-reactivity to inner experience. Respondents are provided with a list of statements (e.g. 'I watch my feelings without getting carried away by them') and rate how often each statement is generally true for them using a five-point Likert scale. It has good internal consistency, with alpha levels  $>0.70$  for the five subscales (Bohlmeijer et al., 2011). Owing to an administrative error, only 18 items of the entire scale were loaded onto the online questionnaire (the excluded items were: 'I think some of my emotions are bad or inappropriate and I shouldn't feel them' (non-judge subscale), 'I notice visual elements in art or nature, such as colours, shapes, textures, or patterns of light and shadow' (observe subscale), 'when I have distressing thoughts or images, I just notice them and let them go' (non-react subscale), 'I do jobs or tasks automatically without being aware of what I'm doing' (act aware subscale), 'I find myself doing things without paying attention' (act aware subscale), 'I disapprove of myself when I have illogical ideas' (non-judgement subscale) – affecting all subscales bar the 'describe' subscale. Data was therefore incomplete for this measure; nevertheless, the scale still retained an alpha  $> .70$ (Table 2).



**State Mindfulness Scale (SMS)** (Tanay & Bernstein, 2013). This 21-item questionnaire measures mindfulness as a state-like mental behaviour. Respondents record on a five-point Likert scale how well statements (e.g. 'I was aware of different emotions that arose in me') describe their recent experiences. It has good internal consistency,  $\alpha=0.89$  (Tanay & Bernstein, 2013). The original scale asks respondents to consider their experience over the past 15 minutes. As this would have caused overlap between study timepoints, the instructions were altered to ask respondents to consider their experiences over the past 5 minutes.

**Brief Multidimensional Measure of Religiousness/Spirituality (BMMRS;** Fetzer, 1999). Two subscales were used. **1) Religious intensity** (e.g. 'To what extent do you consider yourself a religious person?') is a two-item scale to provide self-reported levels of religiousness and spirituality. Participants can rate their religious intensity using four options from 'not' to 'very'. It has internal consistency of  $\alpha = .77$  (Fetzer, 1999). As this study also considered participants' dispositional secularity, a third question of a similar style regarding self-reported secular intensity was added. **2) Daily spiritual experiences** (e.g. 'To what extent can you say you experience the following: I feel God's presence') is a six-item measure that asks about regular spiritual experiences. Respondents record on a six-point Likert scale the perceived frequency of spiritual experiences. It has  $\alpha = .91$  (Fetzer, 1999). Consistent with other studies of MM and spirituality, we altered the text slightly to provide the option for either 'God' or 'a higher power' (Greeson et al., 2011).

**Functional Assessment of Chronic Illness Therapy-Spiritual Wellbeing (FACIT-Sp)** (Peterman, Fitchett, Brady, Hernandez, & Cella, 2002). This 12-item questionnaire was originally designed to explore aspects of spirituality in populations with chronic illness, but has been used successfully in community samples (e.g.

Birnie, Speca, & Carlson, 2010). It has a total score for spiritual wellbeing that is formed of two subscales: Meaning and Peace, and Faith in Illness. Respondents record on a five-point Likert scale how true statements have been for them over the past 7 days (e.g. 'I feel peaceful', 'I find comfort in my faith or spiritual beliefs'). Studies have demonstrated good internal consistency in community samples with  $\alpha = 0.90$  for the total score (Colgrove, Kim, & Thompson, 2007). In accordance with other studies (Birnie et al., 2010) the last two items were altered to more appropriately fit non-illness populations. Owing to the large variety of instruments available for measuring religiosity and spirituality, each with unique and possibly distinct constructs (Monod, Brennan, Rochat, Martin, Rochat, & Büla, 2011) it was decided to include both BMMRS and FACIT-sp.

**Dimensions of Secularity (DoS)** (Schnell, 2015). This 24-item questionnaire measures dispositional secularity based on five domains: agnosticism, atheism, personal responsibility, scientism, and humanism. Respondents are asked to record their agreement with phrases (e.g. 'Science provides solutions to all our problems') on a six-point Likert scale. It has good internal consistency, with alpha levels  $> 0.75$  for the five subscales (Schnell, 2015). It is currently the only measure of secularity as an independent construct to spirituality. Additionally, to this author's knowledge, this is the first investigation of MM that separately measures spirituality and secularity. The original questionnaire was normed and validated on a German speaking population. A translation into English was provided by the author of the measure. Owing to the possible construct overlap between the humanism and personal responsibility subscales with religious / spiritual markers (Schnell, 2015), only the atheism, agnosticism and scientism sub-scales were used in the present study.

### **Credibility / Expectancy Questionnaire (CEQ)** (Borkovec & Nau, 1972).

This five-item measure asks respondents to rate their credibility and expectations for a therapeutic intervention on a nine-point Likert-type scale. Items ask about the (i) seeming logic of, (ii) personal confidence in, (iii) confidence in recommending, (iv) willingness to engage in, and (v) projected success of, a therapy. The entire scale has alpha levels between 0.84 and 0.85 (Deville & Borkovec, 2000). In accordance with other studies (e.g. Nock, Ferriter, & Holmberg, 2006) the questions were modified to focus on MM as the intervention in question.

**Positive and Negative Affect Scale-short form (PANAS-sf)** (Watson, Clark, & Tellegen, 1988). This questionnaire consists of two 10-item subscales that separately assess positive and negative affect. Respondents are provided with a list of positive and negative feelings/emotions (e.g. 'excited', 'upset') and are asked to indicate on a five-point Likert scale how much they feel this way right now. Both the positive and negative scales show high internal consistencies,  $\alpha = 0.89$  for positive affect,  $\alpha = 0.85$  for negative affect (Watson et al., 1998). A higher score on each subscale indicates increased presence of positive or negative affect, with a negative correlation ( $r = -.15$ ) between the two scales.

### **Ethics**

The study was approved by a Canterbury Christ Church University ethics panel (see Appendix 2 for all ethics materials). Participants were supplied with sufficient information to offer informed consent and were debriefed following the close of the study. As the study was administered online, contact information of the study author and supervisor was provided to participants so that should they have any concerns

or wish to ask questions they might have the opportunity to do so. All data were password protected and in anonymous form.

### **Data analysis**

Data were downloaded from Qualtrics into SPSS software, version 23 (IBM, Armonk, NY). Variables were computed from questionnaire items to achieve total scores across the different measures and were screened for normality prior to analysis. Random assignment to induction group was intended to ensure that dispositional variables were sufficiently balanced across groups. This was checked with one-way ANOVAs and chi-squared tests (depending on whether data were continuous or categorical) comparing demographic, trait and baseline state measures across the three induction conditions. Inter-correlations of baseline measures were determined to consider possible relationships between constructs.

In order to clearly distinguish between participants who were more or less spiritually/secularly disposed for testing of congruency interaction effects, spirituality (measured by FACIT-sp) and secularity baseline trait measures were dichotomised using a median split (see DeCoster, Gallucci & Iselin, 2011) resulting in four defined groups: more spiritual / less spiritual, and more secular / less secular. Hypotheses were tested using residualised gains analysis to determine if post-induction CEQ scores were associated with post-intervention affect and state-mindfulness measures, while accounting for predictive effects of scores at earlier timepoints. Group differences across timepoints, as well as congruency effects between group allocation and individual disposition, were investigated via factorial repeated measures ANOVAs.

## Results

### Preliminary analyses

All continuous variables approximated a normal distribution with skewness and kurtosis less than 1.0, except for the daily spiritual experiences subscale of the BMMRS that showed a floor-effect (skewness = 1.13, SE = 0.19). All baseline variables showed a good internal consistency of  $\alpha > 0.70$ , except for FFMQ and BMMRS (religious intensity subscale) (see Table 2). With respect to the BMMRS religious intensity subscale, the item measuring religiosity had a floor effect, with most participants rating themselves as not religious at all ( $n = 93$ ). Owing to concerns with the psychometric properties of the BMMRS in this study, the presence of another measure of spirituality with good psychometric properties (FACIT-sp) and a significant correlation between the two measures in any case (see Table 3), data from the BMMRS were not included when testing hypotheses.

**Table 2***Internal consistency ( $\alpha$ ) of all baseline measures, including subscales.*

<b>Measure</b>	<b><math>\alpha</math></b>
FFMQ	0.78
- Describe	0.81
- Non-react	0.66
- Non-judge	0.69
- Act aware	0.71
- Observe	0.76
BMMRS	0.62
(Religious intensity)	
BMMRS	0.91
(Daily spiritual experiences)	
FACIT-sp	0.74
- Peace and meaning	0.55
- Faith	0.84
DoS	0.88
- Atheism	0.88
- Agnosticism	0.80
- Scientism	0.90
CEQ	0.92
PANAS (positive)	0.89
PANAS (negative)	0.90
SMS	0.95

All baseline variables did not differ significantly across the induction groups ( $p < .05$ ) suggesting that randomisation procedures had resulted in sufficiently balanced groups, except for CEQ ( $F(2,162) = 4.42, p = .01$ ) with the spirituality group having lower mean scores compared to the other two groups. Inter-correlations of baseline measures are displayed in Table 3. As might be expected, state and trait mindfulness were significantly correlated. The spirituality measures were positively correlated with each other but negatively correlated with secularity, such that those with higher spirituality tended to have lower secularity. Additionally, there were

significant correlations between state mindfulness, spirituality (FACIT-sp), positive affect and credibility and expectations, such that those who were more mindful, spiritual and with more positive mood tended to hold greater expectations and credibility for a MBI at baseline. Meanwhile, there trait mindfulness was associated with greater positive affect, lower negative affect and greater spirituality.

**Table 3.**  
Inter-correlations of baseline measures

		CEQ	FFMQ	BMMRS	DoS	SMS	FACIT-sp	PANAS positive	PANAS negative
CEQ	Correlation								
	Sig.								
FFMQ	Correlation	-.007							
	Sig.	.931							
BMMRS	Correlation	.109	.002						
	Sig.	.163	.977						
DoS	Correlation	-.001	.133	-.607**					
	Sig.	.985	.088	.000					
SMS	Correlation	.220**	.191*	.195*	.115				
	Sig.	.005	.014	.012	.142				
FACIT-sp	Correlation	.161*	.364**	.630**	-.255**	.365**			
	Sig.	.039	.000	.000	.001	.000			
PANAS positive	Correlation	.176*	.349**	.105	.090	.353**	.434**		
	Sig.	.024	.000	.180	.248	.000	.000		
PANAS negative	Correlation	.023	-.354**	.067	-.059	.151	-.067	-.006	
	Sig.	.765	.000	.391	.450	.053	.391	.943	

\* p<.05, \*\* p<.01

## Hypothesis testing

### Hypothesis 1.

Hypothesis 1 stated that the integrated role-induction would result in a) greater improvements in credibility and expectations post-induction, and b) superior state mindfulness and affect outcomes post-intervention compared to the spiritual /

secular induction groups. The hypothesis was based on the assumption that more positive expectations of, and credibility for, a mindfulness intervention would predict improved outcomes following the intervention. Consistent with this assumption, a residual gain analysis contrasting pre- and post-induction SMS scores to pre-intervention CEQ scores found a significant residual F-gain for the SMS scores ( $F(1,162) = 46.50, p < .001, R^2 \text{ change} = .10$ ), indicating that higher credibility and expectations post-induction predicted higher state mindfulness post-intervention (even after controlling for increased SMS scores post-induction). However contrary to expectations, residual F-gains of PANAS scores for both positive and negative subscales were not significant (PANAS\_negative:  $F(1,162) = 2.44, p = .12, R^2 \text{ change} = .005$ ; PANAS\_positive:  $F(1,162) = .88, p = .35, R^2 \text{ change} = .001$ ) indicating that higher credibility and expectation scores post-induction were not predictive of improvements in affect post-intervention. Thus, the assumptions of hypothesis 1 were only partially supported by the data.

The overarching hypothesis stated that the integrated induction group would generate greater increases in scores on CEQ, SMS and PANAS both post-induction and post-intervention compared to the secular or spiritual groups. Means and standard deviations for CEQ, SMS, PANAS\_positive, and PANAS\_negative scores across timepoints are shown in Table 4, means plots can be found in Figures 2-5, and the 3x3 repeated measures ANOVAs with timepoint (3 levels: baseline/post-induction/post-intervention) and group allocation (3 levels: integrated/spiritual/secular) are displayed in Table 5.



**Table 4**

Descriptive statistics of state measures for the three induction groups across timepoints

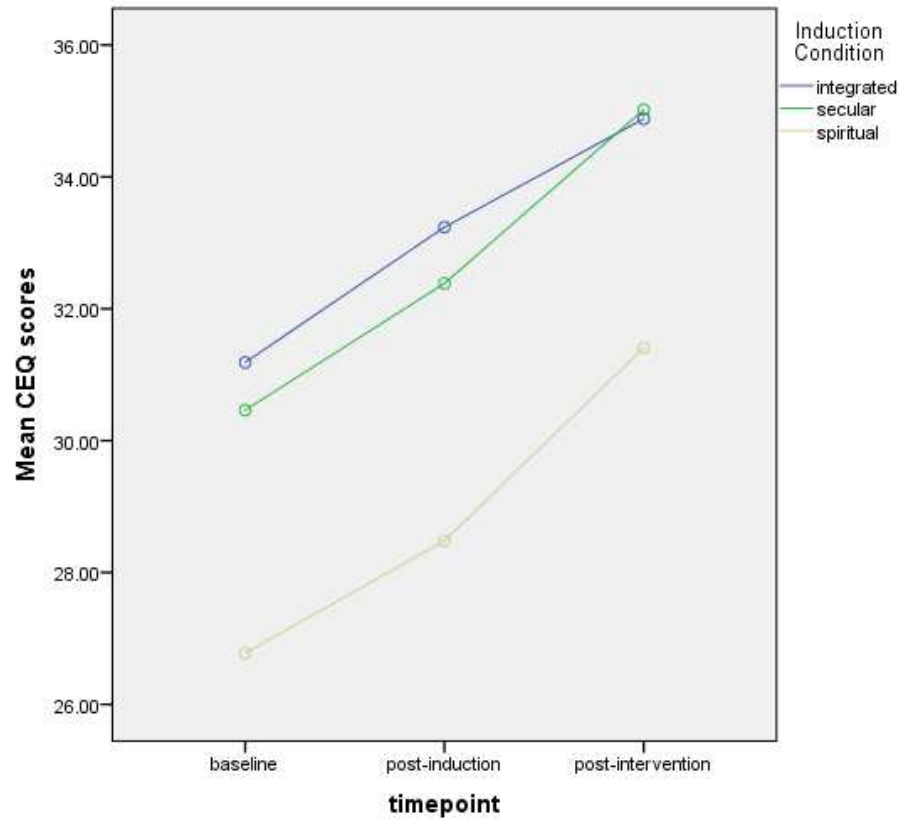
Measure	Integrated (n = 59)	Secular (n = 52)	Spiritual (n = 59)
	Mean (SD)	Mean (SD)	Mean (SD)
CEQ1	31.19 (7.79)	30.46 (8.00)	26.78 (9.21)
CEQ2	33.24 (9.53)	32.38 (8.47)	28.48 (9.28)
CEQ3	34.88 (10.02)	35.02 (8.91)	31.41 (9.97)
SMS1	55.95 (18.51)	52.17 (18.16)	53.24 (18.30)
SMS2	61.93 (19.16)	58.21 (18.54)	54.30 (20.39)
SMS3	75.71 (19.98)	74.35 (22.17)	68.93 (19.83)
PANAS1_positive	24.64 (7.59)	22.52 (7.86)	24.70 (7.95)
PANAS2_positive	25.44 (9.09)	24.17 (9.16)	22.85 (8.33)
PANAS3_positive	25.93 (10.57)	24.35 (9.36)	23.81 (8.33)
PANAS1_negative	14.34 (6.12)	14.63 (6.08)	14.96 (6.31)
PANAS2_negative	12.31 (4.02)	12.65 (3.89)	13.81 (6.53)
PANAS3_negative	11.98 (3.75)	12.21 (4.34)	12.93 (5.22)

Measures: 1=baseline, 2=post-induction, 3=post-intervention

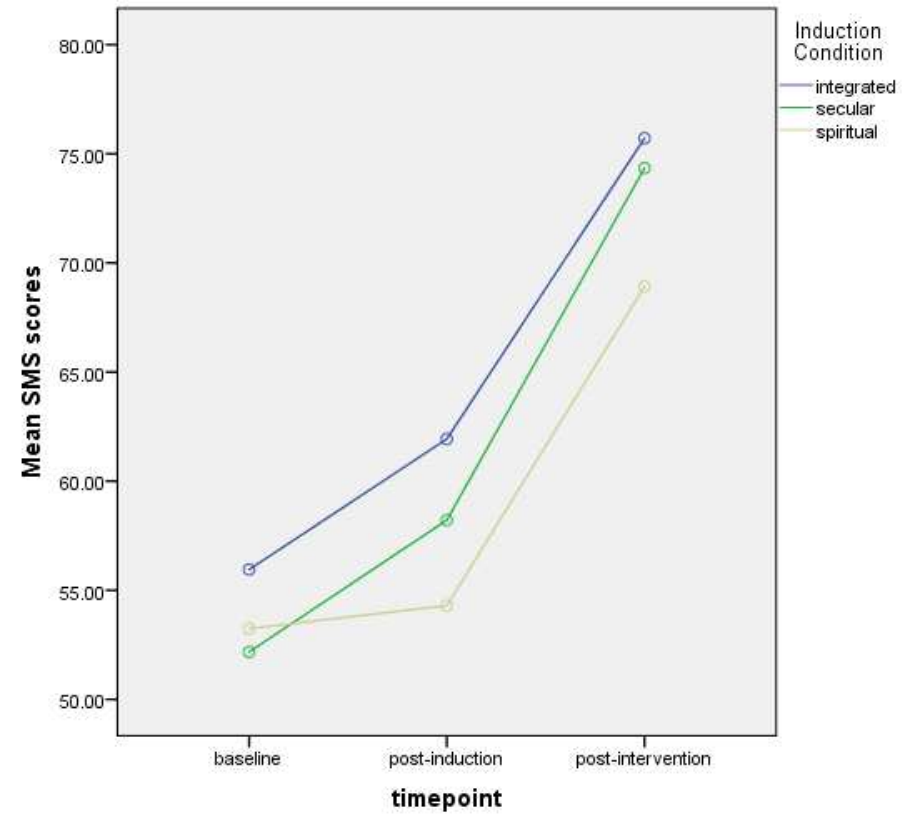
**Table 5**

Results from 3 x 3 repeated measures ANOVAs for all outcome measures with timepoint (3 levels: baseline / post-induction / post-intervention) and induction group condition (3 levels: integrated / secular / spiritual) as factors.

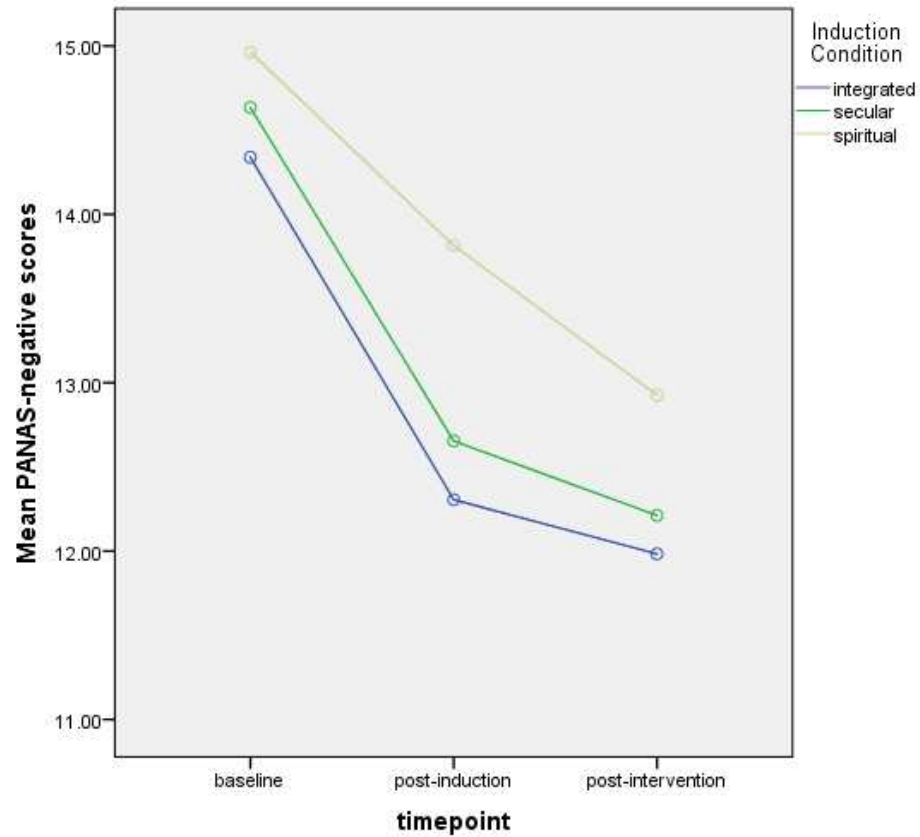
Measure	Group (between subjects)			Timepoint (within subjects)			Timepoint*Group interaction		
	F (2,162)	p	$\eta_p^2$	F (2,324)	p	$\eta_p^2$	F (4,324)	p	$\eta_p^2$
CEQ	4.13	.018*	.049	44.36	.000*	.215	.42	.797	.005
SMS	1.56	.213	.019	131.05	.000*	.447	1.44	.222	.017
PANAS_positive	.77	.466	.009	1.18	.310	.007	2.41	.049*	.029
PANAS_negative	.72	.487	.009	25.59	.000*	.136	.38	.821	.005



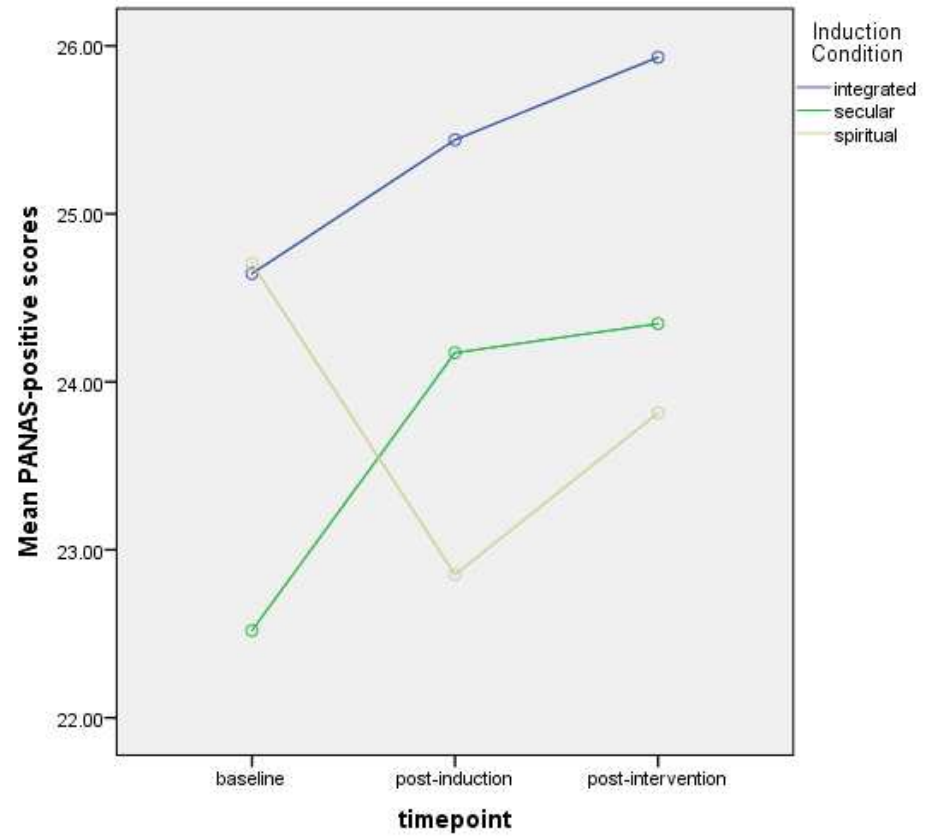
**Figure 2.** Mean CEQ scores against timepoint for each induction group condition.



**Figure 3.** Mean SMS scores against timepoint for each induction group condition.



**Figure 4.** Mean PANAS negative subscale scores against timepoint for each induction group condition.



**Figure 5.** Mean PANAS positive subscale scores against timepoint for each induction group condition.

As can be seen in Table 4 and Figures 2-4, the CEQ and SMS scores for each induction group improved across timepoints, while PANAS negative subscale scores decreased across timepoints (representing a decrease in negative affect). A strong overall main effect of time was found for these measures (CEQ: ( $F(2,324) = 44.36, p < .001, \eta_p^2 = .22$ ); SMS: ( $F(2,324) = 131.05, p < .001, \eta_p^2 = .45$ ); PANAS negative subscale: ( $F(2,324) = 25.59, p < .001, \eta_p^2 = .14$ ), indicating that irrespective of induction group allocation, participants' CEQ and SMS scores significantly increased across timepoints while PANAS\_negative scores significantly decreased across timepoints (representing a reduction in negative affect). Meanwhile, PANAS positive subscale scores (see Figure 5) did not show a main effect of time ( $F(2,324) = 1.18, p = .31$ ). As can be seen in Table 5, there was a significant between subjects difference in CEQ scores, reflecting the spiritual induction group's reduced scores at each timepoint compared to the other two groups, possibly indicative of a randomisation error (as this difference was also present at baseline, see above). Additionally, there was a marginally significant interaction effect for PANAS\_positive scores, though owing to the marked changes across timepoints and groups, this is difficult to interpret.

In order to directly test the specific hypothesis that the integrated induction group would demonstrate greater improvements in outcome measures, the spiritual and secular groups were collapsed into a non-integrated group, allowing for a clear comparison of integrated against non-integrated role-induction conditions.

Accordingly, 3 x 2 repeated measures ANOVAs were performed for each of the dependent variables, with timepoint (three levels: baseline/post-induction/post-intervention) and induction group (two levels: integrated/non-integrated) as factors. In contrast to the hypothesis, none of the timepoint by induction group interaction

effects were statistically significant (CEQ: ( $F(2,326) = .80, p = .45$ ), SMS: ( $F(2,326) = .47, p = .63$ ), PANAS\_negative: ( $F(2,326) = .26, p = .77$ ), PANAS\_positive: ( $F(2,326) = .48, p = .62$ ), indicating that the integrated induction group did not show greater improvements in CEQ, SMS or PANAS scores than the secular or spiritual groups. Thus, while there was a significant main effect of timepoint for CEQ, SMS and PANAS\_negative scores, and while overall higher CEQ scores post-induction did predict higher SMS scores post-intervention (as demonstrated by the residual gains analysis above), participants in the integrated group did not show greater improvements on these measures than participants in the non-integrated groups; hypothesis 1 was not supported.

Despite the lack of significant interaction effects in the ANOVAs above, it may have been that greater score changes from baseline to post-induction or from post-induction to post-intervention were masking interaction effects at the other time interval (e.g. whether the integrated induction group did show superior increases in measures post-induction compared to the non-integrated groups, but these differences were eradicated following intervention). While the ANOVAs reported would not offer the basis for post-hoc tests, the following hypothesis-driven comparisons were carried out to further interrogate the data; six 2 x 2 repeated measures ANOVAs for CEQ, SMS and PANAS\_negative scores were performed: three with earlier timepoint (two levels: baseline / post-induction) and induction group (two levels: integrated / non-integrated) as factors, and three with later timepoint (two levels: post-induction / post-intervention) and induction group (two levels: integrated / non-integrated) as factors. Nevertheless, none of the ANOVAs showed statistically significant timepoint by group interaction effects.

While the hypothesis predicted the superiority of the integrated group, the Introduction raised alternative possibilities for the theoretical superiority of either the secular or spiritual groups. Exploratory analyses were conducted to check if differences existed between non-integrated groups that were being eradicated by collapsing them together, the analyses across the earlier and later timepoints were re-run using three levels for induction group factor (integrated/secular/spiritual). In replication of earlier results, none of these exploratory analyses showed significant timepoint by group interaction effects (excepting the PANAS\_positive scores from baseline to post-induction, ( $F(2,162) = 4.31, p < .015, \eta_p^2 = .05$ ), though as mentioned earlier, the crossover interaction between spiritual and secular induction groups on positive affect alone (see Figures 2-5) is difficult to interpret), suggesting that overall no induction group generated greater improvements than the others. A final check on the analysis was performed by excluding participants who were recorded as either taking too little time to have been able to watch the complete videos and take sufficient time to give consideration to their question answers (< 20 mins) or too much time to have remained primed to their induction condition (> 80 minutes). This similarly resulted in no significant timepoint by group interaction effects.

### **Hypothesis 2.**

This stated that participants whose dispositional preferences were congruent with group allocation (e.g. secular participants in the secular role-induction group) would have greater improvements in CEQ, SMS and PANAS scores, compared to participants who were allocated to an induction that was incongruent with their dispositional preferences (e.g. secular participants in the spiritual role-induction

group). As this analysis was affected by excluding participants who took too little time to have been able to watch the complete videos and take sufficient time to give consideration to their question answers (< 20 mins) or too much time to have remained primed to their induction condition (> 80 minutes), these results exclude those cases. Table 6 displays descriptive statistics for the state measures of the spiritual and secular induction groups across timepoints and across dichotomised spiritual/secular dispositional variables.

**Table 6**

Descriptive statistics of state measures for the spiritual and secular induction groups across timepoints and secular / spiritual disposition.

Measure	Spiritual induction group				Secular induction group			
	Sp. disp.	Mean (SD)	Sec. disp.	Mean (SD)	Sp. disp.	Mean (SD)	Sec. disp.	Mean (SD)
CEQ1	1	26.95 (8.98)	1	28.59 (11.53)	1	30.78 (7.78)	1	33.56 (8.61)
	2	29.11 (10.89)	2	27.45 (8.56)	2	32.50 (7.30)	2	29.38 (5.45)
CEQ2	1	28.48 (9.95)	1	29.53 (10.46)	1	33.17 (8.06)	1	35.56 (7.27)
	2	31.11 (8.95)	2	29.82 (8.88)	2	34.56 (6.38)	2	31.88 (6.92)
CEQ3	1	31.29 (10.53)	1	32.06 (10.43)	1	35.78 (8.13)	1	36.89 (7.90)
	2	34.83 (8.64)	2	33.59 (9.37)	2	37.94 (6.06)	2	36.69 (6.60)
SMS1	1	46.19 (14.68)	1	49.12 (16.50)	1	47.56 (16.65)	1	53.22 (18.63)
	2	53.56 (16.23)	2	49.95 (15.36)	2	58.25 (19.23)	2	51.88 (18.81)
SMS2	1	46.81 (22.50)	1	51.00 (17.22)	1	55.83 (19.21)	1	59.28 (19.02)
	2	54.61 (15.52)	2	49.95 (21.88)	2	60.94 (18.55)	2	57.06 (19.09)
SMS3	1	63.90 (22.81)	1	66.47 (20.45)	1	71.28 (22.99)	1	79.00 (19.00)
	2	75.22 (16.32)	2	71.18 (21.01)	2	87.06 (17.53)	2	78.38 (25.25)
PANAS1 negative	1	15.43 (8.10)	1	14.82 (6.47)	1	15.00 (6.37)	1	14.00 (4.81)
	2	12.94 (1.80)	2	13.86 (5.96)	2	15.25 (6.34)	2	16.38 (7.54)
PANAS2 negative	1	13.05 (5.47)	1	13.41 (5.58)	1	12.44 (3.73)	1	11.89 (2.83)
	2	11.44 (2.01)	2	11.45 (2.74)	2	12.00 (3.01)	2	12.63 (3.95)
PANAS3 negative	1	11.81 (3.84)	1	11.88 (3.18)	1	11.50 (2.92)	1	10.94 (1.30)
	2	11.06 (1.59)	2	11.14 (2.90)	2	11.13 (1.36)	2	11.75 (3.04)
PANAS1 positive	1	22.19 (8.35)	1	21.59 (7.91)	1	19.00 (4.96)	1	24.11 (8.18)
	2	25.89 (7.39)	2	25.68 (7.85)	2	28.44 (7.31)	2	22.69 (7.39)
PANAS2 positive	1	19.62 (7.10)	1	20.71 (7.28)	1	18.67 (4.77)	1	23.89 (8.68)
	2	23.17 (8.56)	2	21.68 (8.50)	2	29.88 (8.51)	2	24.00 (9.14)
PANAS3 positive	1	20.19 (7.54)	1	21.82 (8.75)	1	19.67 (8.01)	1	24.89 (11.11)
	2	25.72 (9.26)	2	23.45 (8.84)	2	30.44 (8.88)	2	24.56 (8.79)

Measures: 1=baseline, 2=post-induction, 3=post-intervention

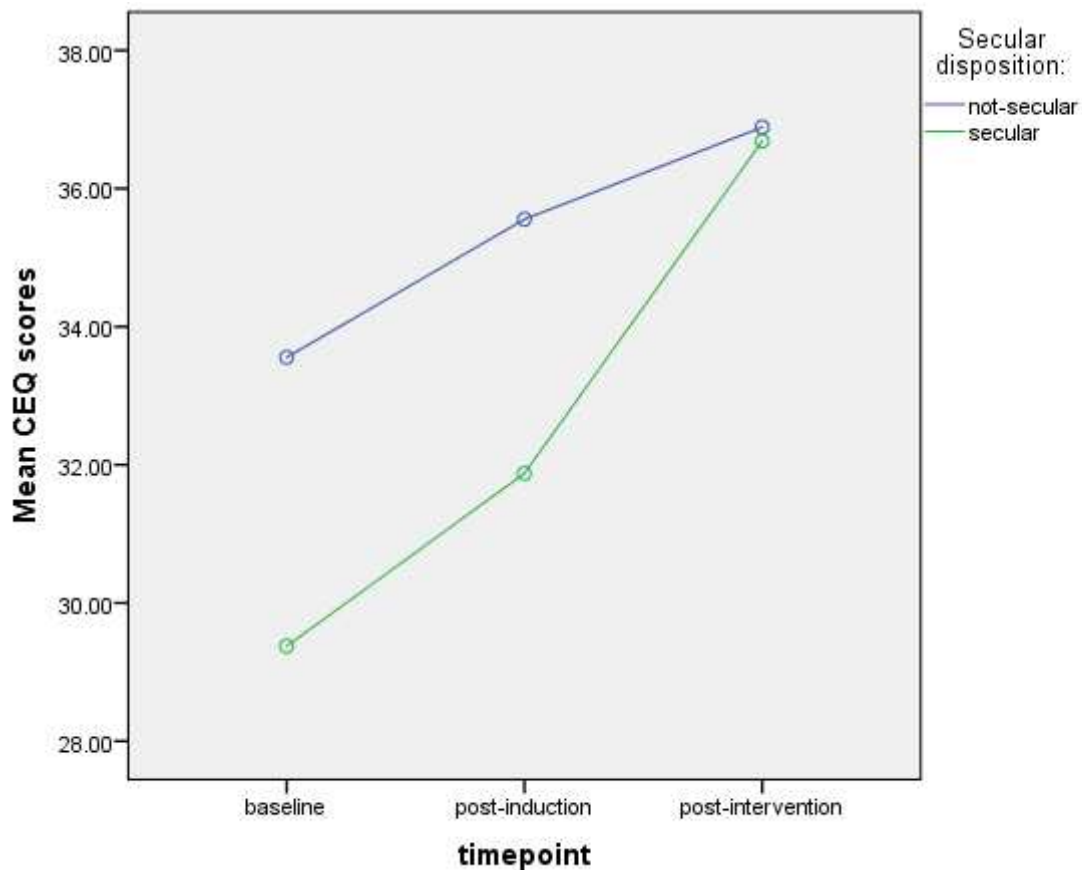
Spiritual disposition (Sp. disp.):  
1=not spiritual (n=21), 2=spiritual (n=18)  
Secular disposition (Sec. disp.):  
1=not secular (n=17), 2=secular (n=22)

Spiritual disposition (Sp. disp.):  
1=not spiritual (n=18), 2=spiritual (n=16)  
Secular disposition (Sec. disp.):  
1=not secular (n=18), 2=secular (n=16)



To determine if there were significant congruency effects for both spirituality and secularity, 3 x 2 x 2 repeated measures ANOVAs were performed for CEQ, SMS and PANAS scores, with timepoint (3 levels: baseline/post-induction/post-intervention), induction condition (2 levels: secular/spiritual), and disposition (2 levels: secular/not-secular or spiritual/not spiritual) as factors. Note that data from the integrated group were not included in the congruency analysis. Should hypothesis 2 be supported, we would expect a 3-way interaction effect such that, for example, under the secular induction there would be more-improved scores post-induction and post-intervention for secular participants while under the spiritual induction there would be less-improved scores post-induction and post-intervention for secular participants, as compared to non-secular participants. Table 7 displays the results for all 3-way interaction effects tested; no significant effects were found and hypothesis 2 was not supported by the data for any outcome variable.

Despite the lack of basis for further hypothesis testing or post-hoc analyses following the non-significant three-way interactions, exploratory analyses were performed on CEQ scores. This is because the means plot of CEQ scores under the secular induction condition alone (Figure 6) suggested the possibility of a three-way interaction, as demonstrated by the greater increases in CEQ scores for secular participants from post-induction to post-intervention compared to non-secular ones. It may have been that the inclusion of data from the spiritual induction condition in the overall ANOVA was masking an interaction effect under the secular condition.



**Figure 6.** Mean CEQ scores against timepoint for secular and non-secular participants under the secular induction condition.

Exploratory analyses that excluded the spiritual induction condition revealed a small congruency effect between secular disposition and secular induction condition for CEQ scores: while a 3 x 2 repeated measures ANOVA with timepoint (3 levels: baseline/post-induction/post-intervention) and secular disposition (2 levels: secular/not secular) under the secular condition was near significant ( $F(2,64) = 2.93$ ,  $p = .061$ ), a 2 x 2 repeated measures ANOVA focused on the latter timepoints (2 levels: post-induction/post-intervention) and secular disposition (2 levels: secular/not secular) under the secular condition was significant ( $F(1,32) = 4.48$ ,  $p = .042$ ,  $\eta_p^2 = .123$ ). This indicated that congruency between secular disposition and secular induction resulted in significantly greater increases in CEQ from post-induction to post-intervention compared to non-secularly disposed participants. Nevertheless,

both the multiple comparisons performed in these exploratory analyses that are susceptible to Type 1 error, and the null result from the overall ANOVA mean that these findings must be interpreted with caution. Further investigations should consider means to better interrogate congruency effects.

**Table 7**

Three-way interaction effects from 3 x 2 x 2 repeated measures ANOVAs for all outcome variables with timepoint (3 levels: baseline / post-induction / post-intervention), induction condition (2 levels: secular / spiritual), and disposition (2 levels: secular / not-secular or spiritual / not spiritual) as factors.

Measure	Disposition Factor	F-test
CEQ	secular / not-secular	F(2,138) = .35, p= .70
	spiritual / not spiritual	F(2,138) = .70, p= .93
SMS	secular / not-secular	F(2,138) = .16, p = .86
	spiritual / not spiritual	F(2,138) = .50, p = .61
PANAS-negative	secular / not-secular	F(2,138) = .46, p = .63
	spiritual / not spiritual	F(2,138) = .82, p = .44
PANAS positive	secular / not-secular	F(2,138) = 1.40, p = .25
	spiritual / not spiritual	F(2,138) = .39, p = .68

Further exploratory analyses did not reveal any further significant interactions for any other outcome measure under either secular or spiritual induction conditions. Thus, the results for SMS, and both PANAS subscales did not suggest any congruency effects for either spiritually or secularly disposed participants as a function of induction group allocation. Tentative congruency effects were found in exploratory analyses of CEQ scores when matched in secularity, but no significant congruency effects were found for CEQ scores when matched in spirituality or in the overall ANOVA.

## Discussion

This study aimed to compare the efficacy of secular, spiritual and philosophically integrated role-inductions, as well as the congruency effects of spiritual/secular disposition and group allocation, on expectations, credibility and outcomes for MM. While results offered partial support for the assumptions of hypothesis 1, demonstrating that higher credibility and expectations post-induction predicted increased state mindfulness and reduced negative affect post-intervention, the overarching hypothesis was not supported; despite all groups showing a main effect of time, improving on measures of credibility and expectations, state mindfulness and negative affect across the experiment, the integrated induction group did not improve more than the secular or spiritual induction groups. Moreover, some of the changes in outcome measures over the course of the experiment, such as reductions in negative affect, only demonstrated a medium effect size with possibly less consequential 'real world' or clinically significant changes (e.g. see McIntyre, Watson & Clark, 1991).

Congruency effects in support for hypothesis 2 were also not found. Exploratory analyses revealed a congruency effect; secular participants recorded greater credibility and expectations for MM compared to non-secular participants when allocated to a congruent secular induction group. Nevertheless, this finding must be interpreted with caution owing to the possibility of Type 1 error from multiple comparisons and the lack of any other congruency effects across groups, dispositions or measures. The findings relating to each hypothesis will now be considered in more detail.

## **Hypothesis 1**

Past research has compared spiritual and secular meditation with mixed findings; while adding explicit spiritual references to TM was associated with greater improvements in outcomes compared to secular TM (Wachholtz & Pargament, 2005), a comparison of secular and spiritual MM showed almost no differences in outcomes (Feuille & Pargament, 2015). Previous studies differed in their experimental manipulation to the current study; they altered the meditation content, while this study manipulated the context via role-induction, leaving the MM-intervention constant. Additionally, this study offered a novel integrated condition that combined spiritual and secular elements as opposed to just having either a spiritual or secular condition.

The null result for group differences in this study may be the result of experimental limitations, it could be that; (i) group effects were present but small with the study underpowered to detect them, (ii) the length and quality of the role-induction and/or the mindfulness training 'intervention' were insufficient to see a difference, or (iii) the online means of delivery meant that participants did not engage as fully as they otherwise might - traditional MBIs typically last 8 weeks, via an in-person group format (e.g. Kabat-Zinn, 1990) which might be a much more engrossing manner of practicing MM. Nevertheless, replicating no significant differences between spiritualised and secularised MM-conditions (Feuille & Pargament, 2015) in contrast to TM (Wachholtz & Pargament, 2005) may suggest that a more fundamental difference exists between MBIs and other meditative traditions.

### **The ‘myth’ of MBIs.**

This study used the theoretical prism of CFs (Wampold et al., 1997; Wampold, 2012) to investigate the ‘myth’ (Frank, 1973) or context of MBIs. It is important to acknowledge that in the absence of this theoretical context, the study would still have asked an important research question, namely, what is the most effective manner of presenting a secular MBI; spiritual, secular or integrated? (to which the evidence suggests that all are as effective as each other). Nevertheless, embedding the research question within a broader theoretical structure offers greater opportunity for analysis and understanding.

The ‘myth’ of a MBI is comprised of spiritual and secular components (Kabat-Zinn, 2003), resulting in a philosophically broad ‘myth’ base. In line with previous research that individuals’ preferences for therapy correlated with expectations (Wanigaratne & Barker, 1995) and improved outcomes when preferences were met (Carlson et al., 2014), hypotheses predicted that what seemed to be the role-induction with the broadest ‘myth’, i.e. the philosophically integrated condition, would meet more participants’ preferences than the narrower secular/spiritual ‘myths’, thereby showing greater improvements in credibility and expectations. Other possible predictions were also present; based on findings that MBIs increase spirituality (see Part A of this thesis) and concerns for the integrity of MBIs (Marx, 2015), reinstating some of a MBI’s spiritual context might have been beneficial. Alternatively, in Western settings, a secular, scientific context may be more generally acceptable and credible. Despite the absence of a non-MM control group (excluded as the study intended to maximally focus on well-powered group differences as opposed to overall changes) making imputations about changes across time more difficult as they could be due to non-specific factors such as relaxation, the

significant main effect of time across groups found in this study may lend support to each of these possibilities holding some but equal validity. However, a more parsimonious explanation could be that a more compelling ‘myth’ was present across all conditions that transcended spiritual/secular divisions, both in this study and in that of Feuille and Pargament (2015).

Despite consistent findings that MBIs increase spirituality and that increases in spirituality are associated with wellbeing outcomes (see Part A of this thesis) very few participants commence or continue meditation practice for spiritual or religious reasons (Pepping et al., 2016). Instead, the most frequently cited reason for commencing and continuing meditation practice is to alleviate emotional distress and enhance emotion regulation (Pepping et al., 2016); or find peace in a frantic world (Williams & Penman, 2011). As all induction groups stressed this primary ‘myth’ of MM, being scripted from the Williams and Penman (2011) text, the ‘myth’ of finding peace may have overridden secular/spiritual ‘myth’ differences. Furthermore, the wide acceptance of secular MBIs in Western society may be due to the propagation of this wellbeing ‘myth’, with the presence of spiritual elements within MBIs a latent or less explicit component. This contrasts with TM whose ‘myth’ may be more explicitly spiritual (Wachholtz & Pargament, 2005).

### **Priming spirituality / secularity.**

Were one to accept the argument of a primary ‘myth’ of finding peace, one might still question why the priming effects of spiritual/secular role-inductions were not strong enough to activate secondary ‘myths’ of spirituality and secularity to achieve group differences. It may be that there were design issues affecting the potency of primes. The aforementioned disparity between the outcomes of MBIs

(increasing spirituality; see Part A of this thesis) and the motivations for practicing MM (little reference to spirituality; Pepping et al., 2016) calls into question the construct of spirituality. Perhaps what people consider spirituality when defining motivations for MM practice is at odds with what measures tap when investigating spirituality, with people having personal definitions of spirituality that have greater religious overtones (Hill & Pargament, 2003). This queries the best method for presenting a spiritual role-induction that meaningfully activates spirituality as tapped by measures such as the FACIT-sp (Peterman et al., 2002) without activating possibly stigmatising and less-relatable religious elements. In this study, we utilised overtly religious images of Buddhist monks in line with the spiritual scripts for the role-induction, while in the Feuille and Pargament (2015) study overt references were made to religion (e.g. 'In Christianity the Holy Spirit is sometimes referred to as the breath of God'). In this study, while 58 participants considered themselves to be moderately to very spiritual, only 37 considered themselves to be moderately to very religious. A spiritual condition without religious overtones may have offered a more appropriate prime for activating spiritual schemata and beliefs.

A similar critique may be levelled at the secular prime; while the DoS questionnaire (Schnell, 2015) measures five domains of secularity; agnosticism, atheism, personal responsibility, scientism, humanism, the images used for the secular role-induction were primarily of a scientific nature. Perhaps a more diverse range of images to encompass the different domains of secularity would have more effectively activated secular schemata. Moreover, the self-report measures used may have confounded results by drawing attention to both participants' secular and spiritual belief systems, eradicating further priming of one belief system over another



during the induction. It may have been better to obtain baseline dispositional measures at a separate time to the induction and intervention.

## **Hypothesis 2**

The absence of almost any congruency effects between disposition and group allocation in this study is in line with recent findings that neither baseline spirituality nor religious affiliation moderated the reduction in depressive symptoms following a MBI, despite increases in spirituality being associated with reduction in depressive symptoms (Greeson et al., 2015), suggesting that MBIs are beneficial across individual differences of dispositional spirituality and religiosity. Additionally, while meeting participant preferences for group allocation was associated with greater increases in outcomes (Carlson et al., 2014) most participants expressed a preference for the MBI (Carlson et al., 2014). The authors draw attention to this; it could be that MBIs show greater improvements, or in this study congruency effects are not noticeable, owing to participants receiving a broadly preferable option, rather than MBIs being mechanistically superior or congruency effects being absent.

### **Congruency and primary ‘myths’**

Re-evaluating the primary ‘myth’ of MBIs (as outlined above) may also explain the lack of congruency effects; the overriding ‘myth’ of finding peace may be broadly congruent, eradicating subtler spiritual/secular congruency effects. Accordingly, even when MM was taught in a traditional Buddhist Vipassana context to spiritually incongruent members of other religious/spiritual backgrounds, participation in the course was not significantly associated with religious identification or level of engagement prior to taking the course or with subsequent engagement in religious

practices (Bowen, Bergman, & Witkiewitz, 2015). These findings suggest that MM practices, even in their Buddhist context, can be appealing and non-threatening to both more spiritual and more secular individuals. In other words, the appeal of the 'ritual' of MM is not significantly affected based upon whether one is predisposed to a more spiritual or secular 'myth', perhaps because the compelling 'myth' of finding peace is primary.

### **Additional limitations**

In addition to the limitations mentioned above, another was the dichotomisation of the spirituality / secularity continuous variables using median split. This was done in an attempt to enhance clarity of expression and to simplify the testing of interaction of effects. However, this did result in a small loss of statistical power (Aiken & West, 1991) and it could be argued that a binary grouping of individuals as either spiritual / non-spiritual or secular / non-secular was an oversimplification (Irwin & McClelland, 2003). It may be that a more complex analysis utilising secular and spiritual dispositional variables in their original continuous form would have yielded different results for the congruency analysis.

Finally, as acknowledged earlier, the theoretical framework of CF theory was not the only manner within which to contextualise the research questions. Indeed, CF theory traditionally addresses therapy-specific issues and MBIs are both deployed in non-therapeutic settings (Pepping et al., 2016), and may arguably be described as not involving traditional therapy (Marx, 2015). Moreover, the oft-studied aspects of CF theory, such as therapeutic alliance (Bordin, 1979) or epistemic trust (Fonagy & Allison, 2014) are not necessarily present in MBIs in which there is less of a relationship between participants and facilitator, and therapeutic alliance is less of

a predictor of outcome (Bowen & Kurz, 2011). CF theory is also not an uncontroversial area with significant detractors from EST approaches (e.g. Roth & Fonagy, 2004). Nevertheless, most theory regarding the 'story' an intervention tells or its induction context is found within CFs approaches and offered a rich theoretical basis to better conceptualise the 'myths' of secular MBIs.

### **Future research**

Future work should further interrogate the 'myth' of MBIs by considering multiple alternative 'myths' and their hierarchical preferences. This will help elucidate CFs in MBIs and how they can be best utilised for clinical efficacy (e.g. if the primary 'myth' is to 'find peace in a frantic world' then greater priority to this aspect of MM should be offered in MBIs). Additionally, more appropriate primes for secular and spiritual conditions should be used to better understand perceptions of, and approaches to, philosophically integrated MBIs.

### **Clinical implications**

A popular debate regarding MBIs is whether they can be ethically or effectively separated from their Buddhist context, with concerns have raised that secular MBIs lose meaning and the capacity to liberate from suffering while placing undue emphasis on acceptance and meditation, thereby reinforcing individualism and value-free techniques (e.g. Grossman, 2011; Marx, 2015). Meanwhile others consider mindfulness as an inherent human capacity that can be practiced outside of any one specific faith tradition (Brown et al. 2011). This study's findings of the broad appeal of the 'myth' of MBIs across spiritually/secularly disposed individuals lends ethical and empirical support to offering MBIs outside of their originating Buddhist

context. Additionally, it may be that too much emphasis is currently being placed in some MBIs on the origins of MM that have not been found to empirically impact outcomes. Instead it may be more effective to shift focus to teaching mindfulness skills, such as the method used in DBT (Linehan, 1993).

## **Conclusion**

This is the first empirical study to investigate the context of MBIs through the prism of CF approaches. Despite not finding group differences with regards the spiritual/secular/philosophically integrated nature of the 'myth' of MBIs, or strong support for congruency effects between participant disposition and group allocation, the results suggest that there might be a superior 'myth' overriding spiritual/secular differences; the 'myth' of finding peace in a frantic world.

## References

- Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Newbury Park, CA: Sage.
- Armstrong, T. D. (1995, August). Exploring spirituality: The development of the Armstrong measure of spirituality. Paper presented at the annual convention of the American Psychological Association, New York, NY.
- Baer, R. A. (2003). Mindfulness training as a clinical intervention: A conceptual and empirical review. *Clinical Psychology: Science and Practice*, 10, 125-143.  
<http://doi.org/10.1093/clipsy.bpg015>
- 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, 27-45.  
<http://doi.org/10.1177/1073191105283504>
- Barnby, J. M., Bailey, N. W., Chambers, R., & Fitzgerald, P. B. (2015). How similar are the changes in neural activity resulting from mindfulness practice in contrast to spiritual practice?. *Consciousness and Cognition*, 36, 219-232.  
<http://doi.org/10.1016/j.concog.2015.07.002>
- Benner, D. G. (1989). Toward a psychology of spirituality: Implications for personality and psychotherapy. *Journal of Psychology and Christianity*, 5, 19–30.
- Beutler, L. E. (2002). The dodo bird is extinct. *Clinical Psychology: Science and Practice*, 9, 30-34. <http://doi.org/10.1093/clipsy.9.1.30>
- Bhikkhu, N. (1979). *The path of purification: Visuddhi Magga*. Kandy, Sri Lanka: Buddhist Publication Society.

- Birnie, K., Speca, M., & Carlson, L. E. (2010). Exploring self-compassion and empathy in the context of mindfulness-based stress reduction (MBSR). *Stress and Health, 26*, 359-371. <http://doi.org/10.1002/smi.1305>
- 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*, 308-320. <http://doi.org/10.1177/1073191111408231>
- Borkovec, T. D., & Nau, S. D. (1972). Credibility of analogue therapy rationales. *Journal of Behavior Therapy and Experimental Psychiatry, 3*, 257-260. [http://doi.org/10.1016/0005-7916\(72\)90045-6](http://doi.org/10.1016/0005-7916(72)90045-6)
- Bowen, S., Bergman, A. L., & Witkiewitz, K. (2015). Engagement in Buddhist meditation practices among non-Buddhists: Associations with religious identity and practice. *Mindfulness, 6*, 1456-1461. <http://doi.org/10.1007/s12671-015-0420-9>
- Bowen, S., & Kurz, A. S. (2011). Between-session practice and therapeutic alliance as predictors of mindfulness after mindfulness-based relapse prevention. *Journal of Clinical Psychology, 68*, 236-245. <http://doi.org/10.1002/jclp.20855>
- Brazier, C. (2013). Roots of mindfulness. *European Journal of Psychotherapy & Counselling, 15*, 127-138. <http://doi.org/10.1080/13642537.2013.795336>
- Brown, K. W., Ryan, R. M., Loverich, T. M., Biegel, G. M., & West, A. M. (2011). Out of the armchair and into the streets: Measuring mindfulness advances knowledge and improves interventions: Reply to Grossman (2011). *Psychological Assessment, 23*:1041–1046. <http://doi.org/10.1037/a0025781>
- Büssing, A., Hedtstück, A., Sauer, S., Michalsen, A., Ostermann, T., & Heusser, P. (2012). Associations between mindfulness, lightheartedness, and inner

correspondence in yoga practitioners. *Mindfulness*, 3, 227-234.

<http://doi.org/10.1007/s12671-012-0098-1>

Carlson, L. E., Tamagawa, R., Stephen, J., Doll, R., Faris, P., Dirkse, D., & Speca, M. (2014). Tailoring mind-body therapies to individual needs: Patients' program preference and psychological traits as moderators of the effects of mindfulness-based cancer recovery and supportive-expressive therapy in distressed breast cancer survivors. *Journal of the National Cancer Institute Monographs*, 50, 308-314. <http://doi.org/10.1093/jncimonographs/lgu034>

Carlson, L. E., Tamagawa, R., Stephen, J., Drysdale, E., Zhong, L., & Speca, M. (2016). Randomized-controlled trial of mindfulness-based cancer recovery versus supportive expressive group therapy among distressed breast cancer survivors (MINDSET): Long-term follow-up results. *Psycho-Oncology*, 25, 750-759. <http://doi.org/10.1002/pon.4150>

Carmody, J., Baer, R. A., Lykins, E., & Olendzki, N. (2009). An empirical study of the mechanisms of mindfulness in a mindfulness-based stress reduction program. *Journal of Clinical Psychology*, 65, 613-626.  
<http://doi.org/10.1002/jclp.20579>

Carmody, J., Reed, G., Kristeller, J., & Merriam, P. (2008). Mindfulness, spirituality, and health-related symptoms. *Journal of Psychosomatic Research*, 64, 393-403. <http://doi.org/10.1016/j.jpsychores.2007.06.015>

Chambers, R., Gullone, E., & Allen, N. B. (2009). Mindful emotion regulation: An integrative review. *Clinical Psychology Review*, 29, 560-572.  
<http://doi.org/10.1016/j.cpr.2009.06.005>

Cole, B. S., Hopkins, C. M., Spiegel, J., Tisak, J., Agarwala, S., & Kirkwood, J. M. (2012). A randomised clinical trial of the effects of spiritually focused

- meditation for people with metastatic melanoma. *Mental Health, Religion & Culture*, 15, 161-174. <http://doi.org/10.1080/13674676.2011.562492>
- Colgrove, L. A., Kim, Y., & Thompson, N. (2007). The effect of spirituality and gender on the quality of life of spousal caregivers of cancer survivors. *Annals of Behavioral Medicine*, 33, 90-98.  
[http://doi.org/10.1207/s15324796abm3301\\_10](http://doi.org/10.1207/s15324796abm3301_10)
- Cotton, S., Puchalski, C. M., Sherman, S. N., Mrus, J. M., Peterman, A. H., Feinberg, J., ... & Tsevat, J. (2006). Spirituality and religion in patients with HIV/AIDS. *Journal of General Internal Medicine*, 21, S5-S13.  
<http://doi.org/10.1111/j.1525-1497.2006.00642.x>
- Crane, R. S., Brewer, J., Feldman, C., Kabat-Zinn, J., Santorelli, S., Williams, J. M. G., & Kuyken, W. (2017). What defines mindfulness-based programs? The warp and the weft. *Psychological Medicine*, 47, 990-999.  
<http://doi.org/10.1017/S0033291716003317>
- Cuijpers, P. (2017). Four decades of outcome research on psychotherapies for adult depression: An overview of a series of meta-analyses. *Canadian Psychology/Psychologie Canadienne*, 58, 7. <http://doi.org/10.1037/cap0000096>
- De Coster, J., Gallucci, M., & Iselin, A. (2011). Best practices for using median splits, artificial categorization, and their continuous alternatives. *Journal of Experimental Psychopathology*, 2, 197-209. <http://doi.org/10.5127/jep.008310>
- Deville, G. J., & Borkovec, T. D. (2000). Psychometric properties of the credibility/expectancy questionnaire. *Journal of Behavior Therapy and Experimental Psychiatry*, 31, 73-86. [http://doi.org/10.1016/S0005-7916\(00\)00012-4](http://doi.org/10.1016/S0005-7916(00)00012-4)



- Doyle, D. (1992). Have we looked beyond the physical and psychosocial? *Journal of Pain and Symptom Management*, 7, 302–311. [http://doi.org/10.1016/0885-3924\(92\)90063-N](http://doi.org/10.1016/0885-3924(92)90063-N)
- Duncan, B. L., Miller, S. D., Wampold, B. E., & Hubble, M. A. (2010). *The heart and soul of change: Delivering what works in therapy*. Washington, DC: American Psychological Association.
- Einolf, C. J. (2013). Daily spiritual experiences and prosocial behavior. *Social Indicators Research*, 110, 71-87. <http://doi.org/10.1007/s11205-011-9917-3>
- Faul, F., Erdfelder, E., Lang, A. G., & Buchner, A. (2007). G\* Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, 39, 175-191. <http://doi.org/10.3758/BF03193146>
- Fetzer/National Institute on Aging Working Group (1999). *Multidimensional measurement of religiousness/spirituality for use in health research: A report of the Fetzer/National Institute on Aging Working Group*. Kalamazoo, MI: Fetzer Institute.
- Feuille, M., & Pargament, K. (2015). Pain, mindfulness, and spirituality: A randomized controlled trial comparing effects of mindfulness and relaxation on pain-related outcomes in migraineurs. *Journal of Health Psychology*, 20, 1090-1106. <https://doi.org/10.1177/1359105313508459>
- Fonagy, P., & Allison, E. (2014). The role of mentalizing and epistemic trust in the therapeutic relationship. *Psychotherapy*, 51, 372. <http://doi.org/10.1037/a0036505>
- Frank, J. (1973). *Persuasion and healing: A comparative study of psychotherapy* (2nd ed.). Baltimore, MD: Johns Hopkins University Press.

- Germer, C. K., Siegel, R. D., & Fulton, P. R. (Eds.). (2005). *Mindfulness and psychotherapy*. New York, NY: Guilford Press.
- Greenberg, R. P., Constantino, M. J., & Bruce, N. (2006). Are patient expectations still relevant for psychotherapy process and outcome?. *Clinical Psychology Review, 26*, 657-678. <http://doi.org/10.1016/j.cpr.2005.03.002>
- Greeson, J. M., Smoski, M. J., Suarez, E. C., Brantley, J. G., Ekblad, A. G., Lynch, T. R., & Wolever, R. Q. (2015). Decreased symptoms of depression after mindfulness-based stress reduction: Potential moderating effects of religiosity, spirituality, trait mindfulness, sex, and age. *The Journal of Alternative and Complementary Medicine, 21*, 166-174. <http://doi.org/10.1089/acm.2014.0285>
- Greeson, J. M., Webber, D. M., Smoski, M. J., Brantley, J. G., Ekblad, A. G., Suarez, E. C., & Wolever, R. Q. (2011). Changes in spirituality partly explain health-related quality of life outcomes after mindfulness-based stress reduction. *Journal of Behavioral Medicine, 34*, 508-518. <http://doi.org/10.1007/s10865-011-9332-x>
- Grossman, P. (2011). Defining mindfulness by how poorly I think I pay attention during everyday awareness and other intractable problems for psychology's (re) invention of mindfulness: Comment on Brown et al. (2011). *Psychological Assessment, 23*:1034–1040. <http://doi.org/10.1037/a0022713>
- Harrington, N., & Pickles, C. (2009). Mindfulness and cognitive behavioral therapy: Are they compatible concepts?. *Journal of Cognitive Psychotherapy, 23*, 315-323. <http://doi.org/10.1891/0889-8391.23.4.315>
- Hayes, S. C., Strosahl, K. D., & Wilson, K. G. (1999). *Acceptance and commitment therapy: An experiential approach to behavior change*. New York, NY: Guilford Press.

- Hill, P. C., & Pargament, K. I. (2003). Advances in the conceptualization and measurement of religion and spirituality: Implications for physical and mental health research. *American Psychologist*, 58, 64-74.  
<http://doi.org/10.1037/0003-066X.58.1.64>
- Hölzel, B. K., Lazar, S. W., Gard, T., Schuman-Olivier, Z., Vago, D. R., & Ott, U. (2011). How does mindfulness meditation work? Proposing mechanisms of action from a conceptual and neural perspective. *Perspectives on Psychological Science*, 6, 537-559. <http://doi.org/10.1177/1745691611419671>
- Irwin, J. R., & McClelland, G. H. (2003). Negative consequences of dichotomizing continuous predictor variables. *Journal of Marketing Research*, 40, 366-371.  
<http://doi.org/10.1509/jmkr.40.3.366.19237>
- 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, 33-47.  
[http://doi.org/10.1016/0163-8343\(82\)90026-3](http://doi.org/10.1016/0163-8343(82)90026-3)
- Kabat-Zinn, J. (1990). *Full catastrophe living: Using the wisdom of your body and mind to face stress, pain, and illness*. New York, NY: Delacorte.
- Kabat-Zinn, J. (1994). *Wherever you go, there you are: Mindfulness meditation in everyday life*. New York, NY: Hyperion Books.
- Kabat-Zinn, J. (2003). Mindfulness-based interventions in context: Past, present, and future. *Clinical Psychology: Science and Practice*, 10, 144-156.  
<http://doi.org/10.1093/clipsy.bpg016>
- 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, 1041-1056. <http://doi.org/10.1016/j.cpr.2011.04.006>

- Khoury, B., Lecomte, T., Fortin, G., Masse, M., Therien, P., Bouchard, V., ... & Hofmann, S. G. (2013). Mindfulness-based therapy: A comprehensive meta-analysis. *Clinical Psychology Review*, 33, 763-771.  
<http://doi.org/10.1016/j.cpr.2013.05.005>
- King, M., Speck, P., & Thomas, A. (2001). The royal free interview for spiritual and religious beliefs: Development and validation of a self-report version. *Psychological Medicine*, 31, 1015-1023.  
<http://doi.org/10.1017/S0033291701004160>
- Kristeller, J. L. (2010). Spiritual engagement as a mechanism of change in mindfulness- and acceptance-based therapies. In R. A. Baer (Ed.), *Assessing mindfulness and acceptance processes in clients: Illuminating the theory and practice of change* (pp. 155–184). Oakland, CA: New Harbinger.
- Kuyken, W., Watkins, E., Holden, E., White, K., Taylor, R. S., Byford, S., ... & Dalgleish, T. (2010). How does mindfulness-based cognitive therapy work? *Behaviour Research and Therapy*, 48, 1105-1112.  
<http://doi.org/10.1016/j.brat.2010.08.003>
- Larson, D.B., Swyers, J.P., & McCullough, M.E. (Eds.). (1998). *Scientific research on spirituality and health: A consensus report*. Rockville, MD: National Institute for Healthcare Research.
- Laska, K. M., Gurman, A. S., & Wampold, B. E. (2014). Expanding the lens of evidence-based practice in psychotherapy: A common factors perspective. *Psychotherapy*, 51, 467. <http://doi.org/10.1037/a0034332>
- Lazaridou, A., & Pentaris, P. (2016). Mindfulness and spirituality: Therapeutic perspectives. *Person-Centered & Experiential Psychotherapies*, 15, 235-244.  
<http://doi.org/10.1080/14779757.2016.1180634>

- Linehan, M. (1993). *Cognitive-behavioral treatment of borderline personality disorder*. New York, NY: Guilford Press.
- Mackenzie, M. J., Carlson, L. E., Munoz, M., & Speca, M. (2007). A qualitative study of self-perceived effects of mindfulness-based stress reduction (MBSR) in a psychosocial oncology setting. *Stress and Health, 23*, 59-69.  
<http://doi.org/10.1002/smi.1120>
- Marx, R. (2015). Accessibility versus integrity in secular mindfulness: A Buddhist commentary. *Mindfulness, 6*, 1153-1160. <http://doi.org/10.1007/s12671-014-0366-3>
- McIntyre, C. W., Watson, D., Clark, L. A., & Cross, S. A. (1991). The effect of induced social interaction on positive and negative affect. *Bulletin of the Psychonomic Society, 29*, 67-70. <http://doi.org/10.3758/BF03334773>
- Miller, W. R., & Thoresen, C. E. (2003). Spirituality, religion, and health: An emerging research field. *American Psychologist, 58*, 24. <http://doi.org/10.1037/0003-066X.58.1.24>
- Monod, S., Brennan, M., Rochat, E., Martin, E., Rochat, S., & Büla, C. J. (2011). Instruments measuring spirituality in clinical research: A systematic review. *Journal of General Internal Medicine, 26*, 1345-1357.  
<http://doi.org/10.1007/s11606-011-1769-7>
- Moritz, S., Quan, H., Rickhi, B., Liu, M., Angen, M., Vintila, R., ... & Toews, J. (2006). A home study-based spirituality education program decreases emotional distress and increases quality of life-a randomized, controlled trial. *Alternative Therapies in Health and Medicine, 12*, 26. Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/17131979>

- Nock, M. K., Ferriter, C., & Holmberg, E. (2007). Parent beliefs about treatment credibility and effectiveness: Assessment and relation to subsequent treatment participation. *Journal of Child and Family Studies*, 16, 27-38. <http://doi.org/10.1007/s10826-006-9064-7>
- O'Collins, G., & Farrugia, E. G. (1991). *A concise dictionary of theology*. New York: Paulist Press.
- Ozawa-de Silva, C. & Ozawa-de Silva, B. (2010). Secularizing religious practices: A study of subjectivity and existential transformation in Naikan therapy. *Journal for the Scientific Study of Religion*, 49, 147-161. <http://doi.org/10.1111/j.1468-5906.2010.01497.x>
- Pargament, K. I. (1997). *The psychology of religion and coping: Theory, research, and practice*. New York, NY: Guilford Press.
- Pepping, C. A., Walters, B., Davis, P. J., & O'Donovan, A. (2016). Why do people practice mindfulness? An investigation into reasons for practicing mindfulness meditation. *Mindfulness*, 7, 542-547. <http://doi.org/10.1007/s12671-016-0490-3>
- Peterman, A. H., Fitchett, G., Brady, M. J., Hernandez, L., & Cella, D. (2002). Measuring spiritual wellbeing in people with cancer: The functional assessment of chronic illness therapy-spiritual wellbeing scale (FACIT-Sp). *Annals of Behavioral Medicine*, 24, 49-58. [http://doi.org/10.1207/S15324796ABM2401\\_06](http://doi.org/10.1207/S15324796ABM2401_06)
- Roth, A., & Fonagy, P. (1996). *What works for whom? A critical review of psychotherapy research*. New York: Guilford Press.

- Schnell, T. (2015). Dimensions of secularity (DoS): An open inventory to measure facets of secular identities. *The International Journal for the Psychology of Religion*, (just-accepted), 1-45. <http://doi.org/10.1080/10508619.2014.967541>
- Segal, Z. V., Williams, J. M. G., & Teasdale, J. D. (2002). *Mindfulness-based cognitive therapy for depression: A new approach to preventing relapse*. New York, NY: Guilford Press.
- Shapiro, S. L., Carlson, L. E., Astin, J. A., & Freedman, B. (2006). Mechanisms of mindfulness. *Journal of Clinical Psychology*, 62, 373-386. <http://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, 581-599. <http://doi.org/10.1023/A:1018700829825>
- Shorey, R. C., Gawrysiak, M. J., Anderson, S., & Stuart, G. L. (2015). Dispositional mindfulness, spirituality, and substance use in predicting depressive symptoms in a treatment-seeking sample. *Journal of Clinical Psychology*, 71, 334-345. <http://doi.org/10.1002/jclp.22139>
- Stiles, W. B., Shapiro, D. A., & Elliott, R. (1986). Are all psychotherapies equivalent?. *American Psychologist*, 41, 165. <http://doi/10.1037/0003-066X.41.2.165>
- Tanay, G., & Bernstein, A. (2013). State mindfulness scale (SMS): Development and initial validation. *Psychological Assessment*, 25, 1286. <http://doi.org/10.1037/a0034044>
- Wachholtz, A. B., & Pargament, K. I. (2005). Is spirituality a critical ingredient of meditation? Comparing the effects of spiritual meditation, secular meditation, and relaxation on spiritual, psychological, cardiac, and pain outcomes. *Journal*

of Behavioral Medicine, 28, 369-384. <http://doi.org/10.1007/s10865-005-9008-5>

Wachholtz, A. B., & Pargament, K. I. (2008). Migraines and meditation: Does spirituality matter?. *Journal of Behavioral Medicine*, 31, 351-366. <http://doi.org/10.1007/s10865-008-9159-2>

Walitzer, K. S., Dermen, K. H., & Connors, G. J. (1999). Strategies for preparing clients for treatment: A review. *Behavior Modification*, 23, 129-151. <http://doi.org/10.1177/0145445599231006>

Wampold, B. E. (2012). Humanism as a common factor in psychotherapy. *Psychotherapy*, 49, 445. <http://doi.org/10.1037/a0027113>

Wampold, B. E., Mondin, G. W., Moody, M., Stich, F., Benson, K., & Ahn, H. N. (1997). A meta-analysis of outcome studies comparing bona fide psychotherapies: Empirically, "all must have prizes.". *Psychological Bulletin*, 122, 203. <http://doi.org/10.1037/0033-2909.122.3.203>

Wanigaratne, S., & Barker, C. (1995). Clients' preferences for styles of therapy. *British Journal of Clinical Psychology*, 34, 215-222. <http://doi.org/10.1111/j.2044-8260.1995.tb01455.x>

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, 1063. <http://doi.org/10.1037/0022-3514.54.6.1063>

Williams, J. M. G., & Kabat-Zinn, J. (2011). Mindfulness: Diverse perspectives on its meaning, origins, and multiple applications at the intersection of science and dharma. *Contemporary Buddhism*, 12, 1-18. <http://doi.org/10.1080/14639947.2011.564811>



Williams, M. & Penman, D. (2011) *Mindfulness: A practical guide to finding peace in a frantic world*. London: Piatkus.

Zinnbauer, B. J., Pargament, K. I., & Scott, A. B. (1999). The emerging meanings of religiousness and spirituality: Problems and prospects. *Journal of personality*, 67, 889-919. <http://doi.org/10.1111/1467-6494.00077>

# **SECTION C**

Samuel D. Landau

**Appendices of supporting material**

SALOMONS CENTRE FOR APPLIED PSYCHOLOGY  
CANTERBURY CHRIST CHURCH UNIVERSITY

## Appendix 1. Experimental materials

Note: this appendix will be removed prior to publication owing for reasons of copyright.

### 1.1 Copy of Qualtrics online experimental programme

#### Introduction



**Thank you for agreeing to take part in this Mindfulness Meditation Taster programme.**

We will be asking you a number of questions about you and your thoughts regarding mindfulness meditation.

We will introduce mindfulness meditation to you and you will have the opportunity to try a short meditation.

You will have the option to receive further information about mindfulness meditation after the programme.

Please note: If the programme freezes, please refresh the page and you will be able to continue from that point.

#### **Consent Form**

**Before we get started we need to obtain your consent to take part in this programme.**

Please read the statements below and click the boxes to confirm your agreement with them.

I confirm that I have read and understand the information email for the above study. I have had the opportunity to consider the information, ask questions by contacting the researcher and if so, have had these answered satisfactorily.

Yes

I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason, without my legal rights being affected.

Yes

I understand that the information I provide will be collected during the study and used by the researcher as data for their research project. I understand that this data will be made anonymous before publication or dissemination.

Yes

I understand that relevant sections of my data collected during the study may be looked at by the co-lead supervisors, Nancy Pistrang, Chris Barker and Fergal Jones. I give permission for these individuals to have access to my data.

Yes

I agree that anonymous quotes from my answers may be used in published reports of the study findings.

Yes

I agree to take part in the study.

Yes

(Alternatively if you do not wish to take part, please close this window in your browser)

### **Experience Check**

**Please let us know if you have previous experience of mindfulness programmes or meditation:**

If you have previously taken part in a mindfulness programme, either face to face or via books / the internet etc, please briefly describe it in the box below.

(The box will expand to fit your answer)

If you have experience of mindfulness practice or other meditative practice please describe it briefly in the box below.

(The box will expand to fit your answer)

### **Demographics**

**We would like to ask you a number of questions about yourself over the next few pages.**

Please answer these questions as best you can.

There are quite a few questions - thank you for taking the time to answer them. After the questions there will be a video introducing mindfulness meditation.

How old are you? (in years)

What gender do you identify yourself as?

Male

Female

No fixed gender

Other

What is the highest level of school achievement you have completed or the highest degree you have received?

Less than GCSE / equivalent

GCSE / equivalent

A level / equivalent

Bachelor's degree

Master's degree

Doctoral degree

What best describes your employment status?

Employee - part time

Employee - full time

Self-employed

Unemployed

Full-time student

How would you describe your national identity? (Select all that apply)

English

Welsh

Scottish

Northern Irish

British

Other (please describe)

What is your ethnic group?

Choose one option that best describes your ethnic group or background.

White

Black / African / Caribbean / Black British

Mixed / Multiple ethnic groups

Asian / Asian British

Other (please describe)

Do you have a specific religion?

Atheist

Agnostic

Church of England / Anglican

Roman Catholic

Protestant

Other Christian

Shi'ite Muslim

Sunni Muslim

Other Muslim

Jew

Hindu

Jain

Sikh

Buddhist

Other (please describe)

How important to you is the practice of your belief (e.g. private meditation, religious services) in your day-to-day life?

Please drag the slider to the number on the scale which best describes your view.

Not important Important  
0 1 2 3 4 5 6 7 8 9 10

### Credibility / Expectancy Questionnaire (CEQ) 1

**We would like you to indicate below how much you believe, right now, that mindfulness meditation will help improve your wellbeing.**

Please answer to the best of your ability even if you are not familiar with what mindfulness meditation is.

Please answer the questions below.

How logical does mindfulness meditation seem to you?

not at all logical			somewhat logical			very logical		
1	2	3	4	5	6	7	8	9

How confident would you be that mindfulness meditation will be successful in improving wellbeing?

not at all confident			somewhat confident			very confident		
1	2	3	4	5	6	7	8	9

How confident would you be in recommending mindfulness meditation to a friend who wants to improve their wellbeing?

not at all confident			somewhat confident			very confident		
1	2	3	4	5	6	7	8	9

If you were feeling that you needed to improve your wellbeing, would you be willing to engage in mindfulness meditation?

not at all			somewhat			very much		
1	2	3	4	5	6	7	8	9

How successful do you feel that mindfulness meditation would be in helping in a different way; for example, help you to feel less stressed, anxious or low in mood?

not at all			somewhat			very much		
1	2	3	4	5	6	7	8	9



## Brief Form Five Facet Mindfulness Questionnaire (FFMQ)

Below is a collection of statements about your everyday experience.

Using the 1–5 scale below, please indicate how frequently or infrequently you have had each experience in the last month.

Please answer according to what really reflects your experience rather than what you think your experience should be.

	never or very rarely true	not often true	sometimes true / sometimes not true	often true	very often or always true
	1	2	3	4	5
I'm good at finding the words to describe my feeling					
I can easily put my beliefs, opinions, and expectations into words					
I watch my feelings without getting carried away by them					
I tell myself that I shouldn't be feeling the way I'm feeling					
It's hard for me to find the words to describe what I'm thinking					
I pay attention to physical experiences, such as the wind in my hair or sun on my face					
I make judgments about whether my thoughts are good or bad.					

I find it difficult to  
stay focused on  
what's happening in  
the present moment

When I have  
distressing thoughts  
or images, I don't let  
myself be carried  
away by them

Generally, I pay  
attention to sounds,  
such as clocks  
ticking, birds  
chirping, or cars  
passing

When I feel  
something in my  
body, it's hard for me  
to find the right  
words to describe it

It seems I am  
"running on  
automatic" without  
much awareness of  
what I'm doing

When I have  
distressing thoughts  
or images, I feel  
calm soon after

I tell myself I  
shouldn't be thinking  
the way I'm thinking

I notice the smells  
and aromas of things

Even when I'm  
feeling terribly upset,  
I can find a way to  
put it into words

I rush through  
activities without  
being really attentive  
to them

Usually when I have  
distressing thoughts  
or images I can just  
notice them without  
reacting

**Brief multidimensional measure of religiousness / spirituality**

**The questions on the next few pages are about your religious, spiritual and secular beliefs and experiences**

To what extent do you consider yourself a religious person?

Very religious

Moderately religious

Slightly religious

Not religious at all

To what extent do you consider yourself a spiritual person?

Very spiritual

Moderately spiritual

Slightly spiritual

Not spiritual at all

To what extent do you consider yourself a secular person?

Very secular

Moderately secular

Slightly secular

Not secular at all

**The following questions deal with possible spiritual experiences.**

To what extent can you say you experience the following:

	Never or almost never	Once in a while	Some days	Most days	Every day	Many times a day
	1	2	3	4	5	6
I feel God's / a higher power's presence.						
I find strength and comfort in my religion / faith.						
I feel deep inner peace or harmony.						
I desire to be closer to or in union with God / a higher power.						
I feel God's / a higher power's love for me, directly or through others.						
I am spiritually touched by the beauty of creation.						

### FACIT-sp

Please indicate on the scale below how true each statement has been for you during the past 7 days.

	Not at all	A little bit	Somewhat	Quite a bit	Very much
	0	1	2	3	4
I feel peaceful.					
I have a reason for living.					
My life has been productive.					

I have trouble feeling  
peace of mind.

I feel a sense of  
purpose in my life.

I am able to reach  
down deep into  
myself for comfort.

I feel a sense of  
harmony within  
myself.

My life lacks  
meaning of purpose.

I find comfort in my  
faith or spiritual  
beliefs.

I find strength in my  
faith or spiritual  
beliefs.

Difficult times have  
strengthened my  
faith or spiritual  
beliefs.

Even during difficult  
times, I know that  
things will be okay.

### Dimensions of Secularity

Please indicate on the scale below how much you agree / disagree with the  
following statements:

Don't agree at all

Completely agree

0      1      2      3      4      5      6

There might be a  
higher power / a  
God, but we will  
never know for sure.

There is no such  
thing as a higher  
power / a God.

I trust in science and  
technology to solve  
the problems of  
humankind.

The existence of a  
higher power / God  
is wishful thinking.

We will never know if  
there is a higher  
power / a God.

Science provides  
solutions to all our  
problems.

The question  
whether there is a  
higher power / a God  
is finally  
unanswerable.

There is no divine  
plan for the universe.

Human thought is  
too limited to know if  
there is a higher  
power / a God.

Natural sciences will  
eventually explain  
everything.

I don't believe in a  
higher power / a  
God.

It is impossible to  
solve the question of  
the existence of a  
higher power / a  
God.

Only the natural  
sciences can make  
valid statements  
about the world.

A higher power /  
God did not create  
man, but man  
created a higher  
power / God.

### Almost there

We are almost through these questions and up to the introductory video...keep on going :)



### PANAS 1

This scale consists of a number of words that describe different feelings and emotions.

Indicate to what extent you feel this way right now, that is, at the present moment.

	Very slightly or not at all	A little	Moderately	Quite a bit	Extremely
	1	2	3	4	5
Interested					
Distressed					

Excited  
Upset  
Strong  
Guilty  
Scared  
Hostile  
Enthusiastic  
Proud  
Irritable  
Alert  
Ashamed  
Inspired  
Nervous  
Determined  
Attentive  
Jittery  
Active  
Afraid

**State Mindfulness Scale 1**

**There is a list of statements below. Please use the rating scale to indicate how well each statement describes your experiences in the past 5 minutes.**

Not at all	A little	Somewhat	Well	Very well
1	2	3	4	5



I was aware of  
different emotions  
that arose in me.

I tried to pay  
attention to pleasant  
and unpleasant  
sensations.

I found some of my  
experiences  
interesting.

I noticed many small  
details of my  
experience.

I felt aware of what  
was happening  
inside of me.

I noticed pleasant  
and unpleasant  
emotions.

I actively explored  
my experience in the  
moment.

I clearly physically  
felt what was going  
on in my body.

I changed my body  
posture and paid  
attention to the  
physical process of  
moving.

I felt that I was  
experiencing the  
present moment  
fully.

I noticed pleasant  
and unpleasant  
thoughts.

I noticed emotions  
come and go.

I noticed various sensations caused by my surroundings (e.g., heat, coolness, the wind on my face).

I noticed physical sensations come and go.

I had moments when I felt alert and aware.

I felt closely connected to the present moment.

I noticed thoughts come and go.

I felt in contact with my body.

I was aware of what was going on in my mind.

It was interesting to see the patterns of my thinking.

I noticed some pleasant and unpleasant physical sensations.

## **Induction Integrated**

### **Introducing Mindfulness Meditation:**

Please watch the following short video clip, specially designed for this Mindfulness Meditation Taster study, that introduces Mindfulness Meditation.

Please ensure that you will be able to hear the soundtrack (e.g. plug in earphones / turn up the volume)

The video lasts for 6 minutes - please do watch the whole thing

(We will then ask you some more questions about it)



Please click the box below when you have finished watching the video:

Finished video

### **Induction Secular**

#### **Introducing Mindfulness Meditation:**

Please watch the following short video clip, specially designed for this Mindfulness Meditation Taster study, that introduces Mindfulness Meditation.

Please ensure that you will be able to hear the soundtrack (e.g. plug in earphones / turn up the volume)

The video lasts for 6 minutes - please do watch the whole thing

(We will then ask you some more questions about it)

Mindfulness Se



Please click the box below when you have finished watching the video:

Finished video

### **Induction Spiritual**

#### **Introducing Mindfulness Meditation:**

Please watch the following short video clip, specially designed for this Mindfulness Meditation Taster study, that introduces Mindfulness Meditation.

Please ensure that you will be able to hear the soundtrack (e.g. plug in earphones / turn up the volume)

The video lasts for 6 minutes - please do watch the whole thing  
(We will then ask you some more questions about it)



Please click the box below when you have finished watching the video:

Finished video

**State Mindfulness Scale 2**

There is a list of statements below. Please use the rating scale to indicate how well each statement describes your experiences in the past 5 minutes.

	Not at all	A little	Somewhat	Well	Very well
	1	2	3	4	5
I was aware of different emotions that arose in me.					
I tried to pay attention to pleasant and unpleasant sensations.					
I found some of my experiences interesting.					

I noticed many small  
details of my  
experience.

I felt aware of what  
was happening  
inside of me.

I noticed pleasant  
and unpleasant  
emotions.

I actively explored  
my experience in the  
moment.

I clearly physically  
felt what was going  
on in my body.

I changed my body  
posture and paid  
attention to the  
physical process of  
moving.

I felt that I was  
experiencing the  
present moment  
fully.

I noticed pleasant  
and unpleasant  
thoughts.

I noticed emotions  
come and go.

I noticed various  
sensations caused  
by my surroundings  
(e.g., heat, coolness,  
the wind on my  
face).

I noticed physical  
sensations come  
and go.

I had moments when  
I felt alert and aware.

I felt closely  
connected to the  
present moment.

I noticed thoughts  
come and go.

I felt in contact with  
my body.

I was aware of what  
was going on in my  
mind.

It was interesting to  
see the patterns of  
my thinking.

I noticed some  
pleasant and  
unpleasant physical  
sensations.

## Credibility / Expectancy Questionnaire (CEQ) 2

We would like you to indicate below how much you believe, right now, that  
mindfulness meditation will help improve your wellbeing.

Please answer the questions below.

How logical does mindfulness meditation seem to you?

not at all logical			somewhat logical			very logical		
1	2	3	4	5	6	7	8	9

How confident would you be that mindfulness meditation will be successful in  
improving wellbeing?

not at all confident			somewhat confident			very confident		
1	2	3	4	5	6	7	8	9

How confident would you be in recommending mindfulness meditation to a friend who wants to improve their wellbeing?

not at all confident			somewhat confident			very confident		
1	2	3	4	5	6	7	8	9

If you were feeling that you needed to improve your wellbeing, would you be willing to engage in mindfulness meditation?

not at all			somewhat			very much		
1	2	3	4	5	6	7	8	9

How successful do you feel that mindfulness meditation would be in helping in a different way; for example, help you to feel less stressed, anxious or low in mood?

not at all			somewhat			very much		
1	2	3	4	5	6	7	8	9

**PANAS 2**

This scale consists of a number of words that describe different feelings and emotions.

**Indicate to what extent you feel this way right now, that is, at the present moment.**

Very slightly or not at all	A little	Moderately	Quite a bit	Extremely
1	2	3	4	5
Interested				
Distressed				
Excited				



Upset  
Strong  
Guilty  
Scared  
Hostile  
Enthusiastic  
Proud  
Irritable  
Alert  
Ashamed  
Inspired  
Nervous  
Determined  
Attentive  
Jittery  
Active  
Afraid

## **Intervention**

**It is now time to try out a short mindfulness meditation practice.**

The meditation will last about eight minutes.

Try and find a space that is conducive to this practice, free from distractions. When you are ready, click on the play button below to begin the audio file.

## Mindfulness Meditation, Body and Breath



Please click the box below when you have finished listening to the meditation practice:

Finished meditation

### State Mindfulness Scale 3

There is a list of statements below. Please use the rating scale to indicate how well each statement describes your experiences in the past 5 minutes.

	Not at all	A little	Somewhat	Well	Very well
	1	2	3	4	5
I was aware of different emotions that arose in me.					
I tried to pay attention to pleasant and unpleasant sensations.					
I found some of my experiences interesting.					

I noticed many small  
details of my  
experience.

I felt aware of what  
was happening  
inside of me.

I noticed pleasant  
and unpleasant  
emotions.

I actively explored  
my experience in the  
moment.

I clearly physically  
felt what was going  
on in my body.

I changed my body  
posture and paid  
attention to the  
physical process of  
moving.

I felt that I was  
experiencing the  
present moment  
fully.

I noticed pleasant  
and unpleasant  
thoughts.

I noticed emotions  
come and go.

I noticed various  
sensations caused  
by my surroundings  
(e.g., heat, coolness,  
the wind on my  
face).

I noticed physical  
sensations come  
and go.

I had moments when  
I felt alert and aware.

I felt closely  
connected to the  
present moment.

I noticed thoughts  
come and go.

I felt in contact with  
my body.

I was aware of what  
was going on in my  
mind.

It was interesting to  
see the patterns of  
my thinking.

I noticed some  
pleasant and  
unpleasant physical  
sensations.

### Credibility / Expectancy Questionnaire (CEQ) 3

**We would like you to indicate below how much you believe, right now, that  
mindfulness meditation will help improve your wellbeing.**

Please answer the questions below.

How logical does mindfulness meditation seem to you?

not at all logical			somewhat logical			very logical		
1	2	3	4	5	6	7	8	9

How confident would you be that mindfulness meditation will be successful in  
improving wellbeing?

not at all confident			somewhat confident			very confident		
1	2	3	4	5	6	7	8	9

How confident would you be in recommending mindfulness meditation to a friend who wants to improve their wellbeing?

not at all confident			somewhat confident			very confident		
1	2	3	4	5	6	7	8	9

If you were feeling that you needed to improve your wellbeing, would you be willing to engage in mindfulness meditation?

not at all			somewhat			very much		
1	2	3	4	5	6	7	8	9

How successful do you feel that mindfulness meditation would be in helping in a different way; for example, help you to feel less stressed, anxious or low in mood?

not at all			somewhat			very much		
1	2	3	4	5	6	7	8	9

### PANAS 3

This scale consists of a number of words that describe different feelings and emotions.

**Indicate to what extent you feel this way right now, that is, at the present moment.**

Very slightly or not at all	A little	Moderately	Quite a bit	Extremely
1	2	3	4	5
Interested				
Distressed				
Excited				

Upset  
Strong  
Guilty  
Scared  
Hostile  
Enthusiastic  
Proud  
Irritable  
Alert  
Ashamed  
Inspired  
Nervous  
Determined  
Attentive  
Jittery  
Active  
Afraid

### **Participation Check**

How much did you engage with the mindfulness practice?

A great deal

A lot

A moderate amount

A little

Not at all

### **Qualitative measures**

How helpful was this mindfulness meditation taster programme?

Very helpful

Moderately helpful

Somewhat helpful

Minimally helpful

Not helpful

Do you feel that you might want to use mindfulness meditation in the future?

Definitely yes

Probably yes

Might or might not

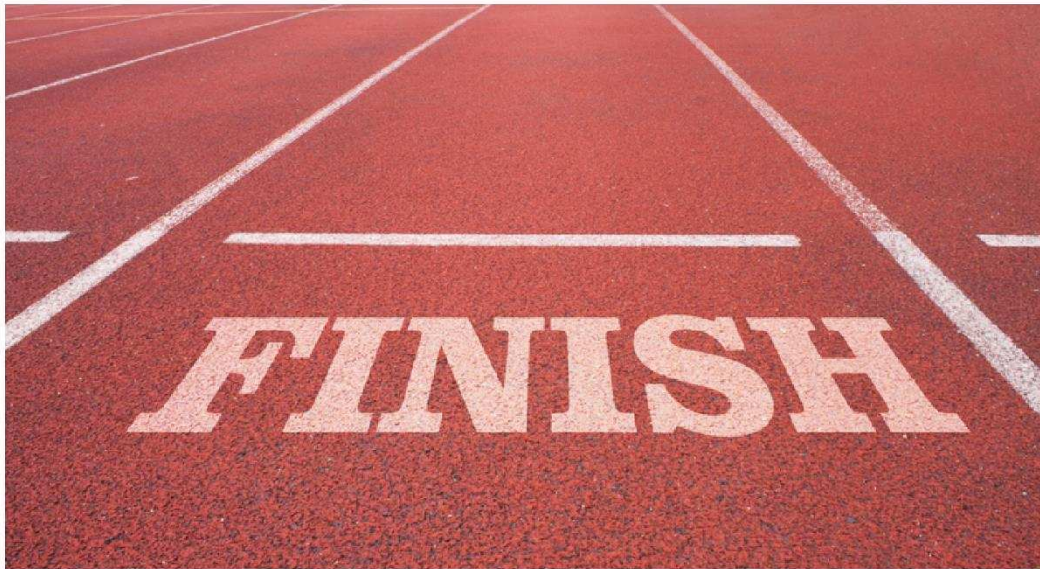
Probably not

Definitely not

Finally, this last question is optional. If you like you can let us know what you thought of the mindfulness taster programme and this study in general. You might like to tell us about both good and bad points. You might also like to suggest changes or improvements.

(The box will expand to fit your answer)

### **Follow up options and debrief**



**You have now finished the mindfulness taster programme. Thank you for taking part.**

If you would like to be entered into prize draw to win one of three £75 vouchers, please enter your email address in the box below:

This study has been trying to better understand the underlying therapeutic factors in mindfulness meditation. Specifically, we have been interested in finding out how the dual nature of mindfulness meditation - drawing upon both spiritual and secular sources - affects a person's credibility, expectations and responses to mindfulness meditation. Moreover, we have been considering whether a person's attitudes to spirituality and secularity affect these variables.

If you would like to learn more about this study and its findings, please enter your email address in the box below:

Powered by Qualtrics



## 1.2 Scripts used for role-inductions

### Introduction (same for all conditions)

Life can be relentless, frantic and exhausting – but it doesn't have to be this way. Mindfulness reveals a set of simple yet powerful practices that you can incorporate into daily life to help break the cycle of anxiety, stress, unhappiness and exhaustion. It helps promote a genuine joie de vivre; the kind of happiness that gets into your bones and allows you to meet the worst that life throws at you with courage. You'll be surprised how quickly you can be back in control and able to enjoy life again.

Mindfulness is about how you can find peace and contentment in troubled and frantic times.

### Philosophically Integrated (spiritual components in blue, secular components in red)

Or rather, mindfulness is about how you can rediscover them; for there are deep wellsprings of peace and contentment living inside us all, no matter how trapped and distraught we might feel. They're just waiting to be liberated from the cage that our frantic and relentless way of life has crafted for them.

We know this to be true because researchers have been studying anxiety, stress and depression for over thirty years at Oxford University and other institutions around the world. This work has discovered the secret to sustained happiness and how you can successfully tackle anxiety, stress, exhaustion and even full-blown depression.

The mindfulness based and cognitive therapy programme was originally designed to help people who had suffered repeated bouts of serious depression to overcome their illness. Clinical trials show that it works. It's been clinically proven to halve the risk of depression in those who have suffered the most debilitating forms of this illness.

The mindfulness based cognitive therapy technique revolves around a form of meditation that was little known in the West until recently. Mindfulness meditation is so beautifully simple that it can be used by the rest of us to reveal our innate joie de vivre. With the discovery of mindfulness, we have found the secret to sustained happiness. It's the kind of happiness and peace that gets into your bones and promotes a deep-seated authentic love of life, seeping into everything you do and helping you to cope more skilfully with the worst that life throws at you. It's a secret that was well understood in the ancient world and kept alive in some cultures even today. But many of us in the Western world have largely forgotten how to live a good and joyful existence.

Over time, mindfulness brings about long-term changes in mood and levels of happiness and wellbeing. Scientific studies have shown that mindfulness not only prevents depression, but that it also positively affects the brain patterns underlying day-to-day anxiety, stress, depression and irritability so that when they arise, they dissolve again more easily. Other studies have shown that regular meditators see

their doctors less often and spend fewer days in hospital. Memory improves, creativity increases and reaction times become faster.

A typical meditation consists of focusing your full attention on your breath as it flows in and out of your body. Focusing on each breath in this way allows you to observe your thoughts as they arise in your mind and, little by little, to let go of struggling with them. You come to realise that thoughts come and go of their own accord; that you are not your thoughts. You can watch as they appear in your mind, seemingly from thin air, and watch again as they disappear, like a soap bubble bursting. You come to the profound understanding that thoughts and feelings (including negative ones) are transient. They come and go, and ultimately, you have a choice about whether to act on them or not.

Mindfulness is about observation without criticism; being compassionate with yourself. When unhappiness or stress hover overhead, rather than taking it all personally, you learn to treat them as if they were black clouds in the sky, and to observe them with friendly curiosity as they drift past. In essence, mindfulness allows you to catch negative thought patterns before they tip you into a downward spiral. It begins the process of putting you back in control of your life.

### Spiritual

Or rather, mindfulness is about how you can rediscover them; for there are deep wellsprings of peace and contentment living inside us all, no matter how trapped and distraught we might feel. They're just waiting to be liberated from the cage that our frantic and relentless way of life has crafted for them.

With the discovery of mindfulness, we have found the secret to sustained happiness. It's the kind of happiness and peace that gets into your bones and promotes a deep-seated authentic love of life, seeping into everything you do and helping you to cope more skilfully with the worst that life throws at you. It's a secret that was well understood in the ancient world and kept alive in some cultures even today. But many of us in the Western world have largely forgotten how to live a good and joyful existence. And it's often worse than this. We try so hard to be happy that we end up missing the most important parts of our lives and destroying the very peace that we were seeking.

The mindfulness based cognitive therapy technique revolves around a form of meditation that was little known in the West until recently. Mindfulness meditation is so beautifully simple that it can be used by the rest of us to reveal our innate *joie de vivre*. Not only is this worthwhile in itself, but it can also prevent normal feelings of anxiety, stress and sadness from spiralling downwards into prolonged periods of unhappiness and exhaustion.

A typical meditation consists of focusing your full attention on your breath as it flows in and out of your body. Focusing on each breath in this way allows you to observe your thoughts as they arise in your mind and, little by little, to let go of struggling with them. You come to realise that thoughts come and go of their own accord; that you are not your thoughts. You can watch as they appear in your mind, seemingly from

thin air, and watch again as they disappear, like a soap bubble bursting. You come to the profound understanding that thoughts and feelings (including negative ones) are transient. They come and go, and ultimately, you have a choice about whether to act on them or not.

Mindfulness is about observation without criticism; being compassionate with yourself. When unhappiness or stress hover overhead, rather than taking it all personally, you learn to treat them as if they were black clouds in the sky, and to observe them with friendly curiosity as they drift past. In essence, mindfulness allows you to catch negative thought patterns before they tip you into a downward spiral. It begins the process of putting you back in control of your life.

Meditation creates greater mental clarity; seeing things with pure open-hearted awareness. It's a place – a vantage point – from which we can witness our own thoughts and feelings as they arise. It takes us off the hair-trigger that compels us to react to things as soon as they happen. Our inner self – the part that is innately happy and at peace – is no longer drowned out by the noise of the mind crunching through problems.

Mindfulness meditation encourages us to become more patient and compassionate with ourselves and to cultivate open-mindedness and gentle persistence. These qualities help free us from the gravitational pull of anxiety, stress and unhappiness. Mindfulness and its practices are designed to help you along this path. And if you follow the path, you'll begin to find peace in a frantic world.

### Secular

We know this to be true because researchers have been studying anxiety, stress and depression for over thirty years at Oxford University and other institutions around the world. This work has discovered the secret to sustained happiness and how you can successfully tackle anxiety, stress, exhaustion and even full-blown depression.

The mindfulness based and cognitive therapy programme was originally designed to help people who had suffered repeated bouts of serious depression to overcome their illness. Clinical trials show that it works. It's been clinically proven to halve the risk of depression in those who have suffered the most debilitating forms of this illness. It's at least as effective as antidepressants, and has none of their downsides. In fact, it's so effective that it's now one of the preferred treatments recommended by the UK's National Institute for Health and Clinical Excellence.

A typical meditation consists of focusing your full attention on your breath as it flows in and out of your body. Focusing on each breath in this way allows you to observe your thoughts as they arise in your mind and, little by little, to let go of struggling with them. You come to realise that thoughts come and go of their own accord; that you are not your thoughts. You can watch as they appear in your mind, seemingly from thin air, and watch again as they disappear. You come to the profound understanding that thoughts and feelings (including negative ones) are transient.

They come and go, and ultimately, you have a choice about whether to act on them or not.

Mindfulness is about observation without criticism; being compassionate with yourself. When unhappiness or stress hover overhead, rather than taking it all personally, you learn to treat them as if they were black clouds in the sky, and to observe them with friendly curiosity as they drift past. In essence, mindfulness allows you to catch negative thought patterns before they tip you into a downward spiral. It begins the process of putting you back in control of your life.

Over time, mindfulness brings about long-term changes in mood and levels of happiness and wellbeing. Scientific studies have shown that mindfulness not only prevents depression, but that it also positively affects the brain patterns underlying day-to-day anxiety, stress, depression and irritability so that when they arise, they dissolve again more easily. Other studies have shown that regular meditators see their doctors less often and spend fewer days in hospital. Memory improves, creativity increases and reaction times become faster.

One of the most astonishing features of mindfulness meditation is that you can see its profoundly positive effects actually changing the brain. Recent scientific advances allow us to see parts of the brain associated with such positive emotions as happiness, empathy and compassion becoming stronger and more active as people meditate.

For many years it was assumed that we all have an emotional thermostat which determines how happy we are in life. Some people were presumed to have a happy disposition, while others had a miserable one. This emotional set-point was presumed to be encoded in our genes or became set in stone during childhood.

Several years ago, this assumption was shattered. Researchers used functional magnetic resonance imaging to discover that mindfulness training allowed people to escape this emotional set-point. These hard-won findings of research from laboratories and clinics all over the world have profound implications. They are changing the way scientists think about the mind and allow us to have confidence in the experiences of the countless thousands of people who have discovered the benefits of mindfulness for themselves.

## 1.3 Script of mindfulness meditation intervention

### Mindfulness of the Breath and Body (Williams and Penman, 2011)

#### Settling

1. Settle into a comfortable position, either lying on a mat or a thick rug, or sitting on a chair, cushion or meditation stool. If you use a chair, it is best to use a firm, straight-backed chair (rather than an armchair), so you can sit away from the back of the chair and the spine can be self-supporting. If you sit on a cushion on the floor, it is helpful if your knees can actually touch the floor, although that may not happen at the beginning. Feel free to experiment with the height of cushions or stool until you feel comfortably and firmly supported. If you have a disability that means that sitting in this way or lying on your back is uncomfortable, find a posture that is comfortable for you, and which best allows you to maintain your sense of being fully awake for each moment.
2. If sitting, allow your back to adopt an erect, dignified posture; neither stiff nor tensed up, but comfortable. If sitting on a chair, have your feet flat on the floor with your legs uncrossed. Allow your eyes to close if that feels comfortable. If not, lower your gaze so it falls, unfocused, a few feet in front of you. If lying down, allow your legs to be uncrossed, with your feet falling away from each other, and your arms lying alongside and slightly away from your body, so that the palms can be open to the ceiling, if that feels comfortable.

#### Bringing awareness to the body

3. Bring your awareness to physical sensations by focusing your attention on the sensations of touch in the body where it is in contact with the floor and with whatever you are sitting or lying on. Spend a few moments exploring these sensations.
4. Now focusing your attention on your feet, starting with the toes, expand the 'spotlight of attention' so it takes in the soles of your feet, the heels and the top of your feet, until you are attending to any and all of the physical sensations you become aware of in both feet, moment by moment. Spend a few moments attending to the feet in this way, noticing how sensations arise and dissolve in awareness. If there are no sensations in this region of the body, simply register a blank. This is perfectly fine – you are not trying to make sensations happen – you are simply registering what is already here when you attend.
5. Now, expand your attention to take in the rest of both legs for a few moments, then the torso (from the pelvis and hips up to the shoulders); then the left arm; then the right arm; then the neck and head.
6. Spend a minute or two resting in the awareness of the whole body. See if it is possible to allow your body and its sensations to be just as you find them. Explore how it is to let go of the tendency to want things to be a certain way.

Even one brief moment of seeing how things are – without wanting to change anything – can be profoundly nourishing.

### **Focusing on the sensations of breathing**

7. Now bring your awareness to the breath as it moves in and out of the body at the abdomen. Notice the changing patterns of physical sensations in this region of the body as the breath moves in and out. It may help to place your hand here for a few breaths, and feel the abdomen rising and falling.
8. You may notice mild sensations of stretching as the abdomen gently rises with each in-breath, and different sensations as the abdomen falls with each out-breath.
9. As best you can, follow closely with your attention, so you notice the changing physical sensations for the full duration of each in-breath and the full duration of each out-breath, perhaps noticing the slight pauses between one in-breath and the following out-breath, and between one out-breath and the following in-breath.
10. There is no need to try to control your breathing in anyway at all – simply let the breath breathe itself.

### **Dealing skilfully with mind-wandering**

Sooner or later (usually sooner), your attention will wander away from the breath. You may find thoughts, images, plans or day-dreams coming up. Such mind-wandering is not a mistake. It is simply what minds do. When you notice that your awareness is no longer on the breath, you might congratulate yourself. You have already 'woken up' enough to know it, and are once more aware of your experience in this moment. Simply acknowledge where the mind had wandered to. Then gently escort your attention back to the sensations in your abdomen.

The mind will likely wander over and over again, so each time, remember that the aim is simply to note where the mind has been, then gently escort your attention back to the breath. This can be very difficult, as you may find it frustrating that the mind seems so disobedient! Such frustration can create a lot of extra noise in the mind. So, no matter how many times your mind wanders, allow yourself on each occasion (without limit) to cultivate compassion for your mind as you bring it back to where you had intended it to be.

See if it is possible to view the repeated wanderings of the mind as opportunities to nurture greater patience within yourself. In time, you may discover that this quality of kindness towards the wandering mind brings a sense of compassion towards other aspects of your experience – that the wandering mind has been a great ally in your practice, and not the enemy you supposed it to be.

Continue with the practice for around eight minutes, or longer if you wish, perhaps reminding yourself from time to time that the intention is simply to be aware of your experience in each moment. As best you can, use the sensations in your body and breath as anchors to gently reconnect with the here and now each time that you notice that your mind has wandered and is no longer in touch with where you had intended it to be.

## Appendix 2. Ethics materials

### 2.1 Copy of ethics committee approval in principle letter



Salomons Centre for Applied Psychology

Samuel Landau

24 November 2015

Direct line 0333 011 7094

E-mail [margie.callanan@canterbury.ac.uk](mailto:margie.callanan@canterbury.ac.uk)

Our Ref V:\075\Ethics\2015-16

Dear Samuel,

**The 'myth' and 'ritual' of mindfulness: effects of manipulating role induction on expectations, credibility and outcomes**

**Outcome: Approval in Principle**

The panel would like to offer approval in principle. Please address the following in a letter to the Chair; once these are satisfactorily addressed then approval can be given. The panel would also request that pagination of the appendices would have been helpful and could this be ensured for any future presentations or submissions.

1. Please provide the final 'adjusted' questionnaires to be used in the study.
2. Please provide a copy of the debrief to be used.
3. Please confirm to the panel that a research professional independent of the study will see the videos to be created (before they are used) and inform us of who this will be.
4. On the consent form it is not clear why point 4 is included as it seems that there are no interviews planned. Please clarify and / or correct.
5. Please consider with supervisors the response of 'no' in section eleven of the form: the panel are of the view that there is evidence that relaxation can induce some discomfort in some people, and the questionnaires planned can provoke an emotional response the degree of which is not always possible to predict. There is not a significant concern about this but the panel would like to see a more thoughtful account of the issue of potential discomfort than is presented.

The panel would also like to recommend that personal professional indemnity insurance is seriously considered, as institutional and employer insurance primarily aims to cover the employer and/or institution

Yours sincerely,

*pp. C. Hogg*

**Dr Caroline Hogg**  
Chair of the Salomons Ethics Panel

Cc F Jones

School of Psychology, Politics and Sociology  
Faculty of Social and Applied Sciences

Canterbury Christ Church University  
Runcie Court David Salomons Estate  
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Professor Rama Thirunamachandran, Vice-Chancellor and Principal

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## 2.2 Copy of email reply to the ethics committee

Dear Ethics Panel,

### **The 'myth' and 'ritual' of mindfulness: effects of manipulating role induction on expectations, credibility and outcomes**

Thank you for your letter confirming approval in principle.

**I recently realised that I have had a misunderstanding about ethics. I have already conducted the study (I was under the impression that approval in principle was sufficient to go ahead). I have reflected with my supervisors on the potential risks that could have occurred should there have been ethical issues raised by participants or should someone not embedded in the study have considered the videos to be inappropriate in some way. I apologise for the oversight and will learn from this experience. Nevertheless, I followed the points that were made in the provisional approval letter during the conduct of the study, in the ways set out below.**

Please see my responses below to the different points raised in the letter:

1. Please provide the final 'adjusted' questionnaires to be used in the study.

**This is attached as a PDF to the email. The final 'script' is printed out from Qualtrics so that it can be reviewed in the exact form that participants saw it.**

2. Please provide a copy of the debrief to be used.

**The draft debrief has been attached as a separate Word document to the email. This will be emailed to the participants once approved by the committee.**

3. Please confirm to the panel that a research professional independent of the study will see the videos to be created (before they are used) and inform us of who this will be.

**I am afraid that owing to my misunderstanding regarding ethics approval I did not find a research professional external to the study to review the videos prior to the study being released. Certainly, my supervisors and a fellow trainee looked at them in advance. And in retrospect a member of UCL clinical psychology staff also looked at them and approved them with no concerns (Dr Kat Alcock).**

4. On the consent form it is not clear why point 4 is included as it seems that there are no interviews planned. Please clarify and / or correct.

**This point has now been corrected and the up to date consent questions can be read on the final script.**



5. Please consider with supervisors the response of 'no' in section eleven of the form: the panel are of the view that there is evidence that relaxation can induce some discomfort in some people, and the questionnaires planned can provoke an emotional response the degree of which is not always possible to predict. There is not a significant concern about this but the panel would like to see a more thoughtful account of the issue of potential discomfort than is presented.

**I have had further discussions with my supervisors regarding this point, particularly after recent evidence has emerged about the unhelpfulness (as well as the helpfulness) of mindfulness meditation. in the context of this study, asking religious / spiritual people to accept their thoughts may have been asking them to do something that is against their religion / spirituality and could therefore have been uncomfortable.**

Yours sincerely,

Samuel Landau

## 2.3 Copy of ethics committee final approval letter



Salomons Centre for Applied Psychology

Samuel Landau

05 April 2017

Direct line 0333 011 7094

E-mail [margie.callanan@canterbury.ac.uk](mailto:margie.callanan@canterbury.ac.uk)

Our Ref V:\075\Ethics\2015-16

Dear Samuel,

**The 'myth' and 'ritual' of mindfulness: effects of manipulating role induction on expectations, credibility and outcomes**

**Outcome: Full Approval**

Thank you for addressing the points raised by the Ethics Panel so thoroughly, we are pleased to see the care taken to look at the potential risk issues of proceeding with the first level of scrutiny and approval. As the points raised by the panel at that point were not substantive, and have been satisfactorily addressed in the process, we are satisfied that all are in order and are pleased to offer you approval for your proposed study.

We look forward to receiving a short report on progress and outcome on completion of the research, in order to complete our file. The report should be the same one that is provided to your participants. Please note that any changes of substance to the research will need to be notified to us so that we can ensure continued appropriate ethical process.

We wish you well with your study and hope that you enjoy carrying it out.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'Caroline Hogg'.

**Dr Caroline Hogg**  
Chair of the Salomons Ethics Panel

Cc F Jones

School of Psychology, Politics and Sociology  
Faculty of Social and Applied Sciences

Canterbury Christ Church University  
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Professor Rama Thirunamachandran, Vice-Chancellor and Principal

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## 2.4 Information sheet provided prior to study

### **Mindfulness Meditation Taster Study** Information sheet

Hello. My name is Samuel Landau and I am a trainee clinical psychologist at Canterbury Christ Church University.

**I would like to invite you to take part in a research study that will give you an introduction to, and a taster of, mindfulness meditation.** As a thank you for taking part you will have the option to be entered into a prize draw for one of three £75 vouchers.

**To access the study follow this link:**

[https://cccusocialsciences.az1.qualtrics.com/SE/?SID=SV\\_byGWko0Qed63axD](https://cccusocialsciences.az1.qualtrics.com/SE/?SID=SV_byGWko0Qed63axD)

This email gives information about the reasons for the study and what participation will involve.



#### **What is the purpose of the study?**

To better understand the underlying therapeutic factors in mindfulness meditation.

#### **Why have I been invited?**

I am contacting a range of people who may be interested in experiencing a taster of mindfulness meditation and contributing to research. I am hoping that approximately 150 people will take part.

#### **Do I have to take part?**

It is up to you to decide to take part. If you would like to, then I will ask you to confirm your consent to participate at the beginning of the study. You are free to withdraw at any time without giving a reason.

#### **What will taking part involve?**

The study is in a number of stages:

1. Questionnaire
2. Video introduction to mindfulness meditation
3. Brief questionnaire
4. Mindfulness meditation taster
5. Brief questionnaire

The study will last about 45 minutes and will be presented online. You will need a quiet space and possibly headphones for the study to allow you to experience this mindfulness meditation taster. You will be asked to answer the questions, watch the video introduction and take part in the mindfulness meditation taster. The meditation will not require you to do any movements or move from sitting in front of the computer.

As a thank you for taking part you will have the option to be entered into a prize draw with the opportunity to win one of three £75 vouchers

**What are the possible disadvantages and risks of taking part?**

I do not envisage there being any possible disadvantages or risks of taking part.

**What are the possible benefits of taking part?**

It may be helpful and interesting to experience a taster of mindfulness meditation. I will provide the option to receive further information after the study if you would like to find out more.

Moreover, the study will help us to better understand the underlying therapeutic factors in mindfulness meditation which may influence future therapy and research.

**What if there is a problem?**

If you have any problems, please contact me via email: [s.d.landau431@canterbury.ac.uk](mailto:s.d.landau431@canterbury.ac.uk)  
For further information, see below.

**Will my taking part in the study be kept confidential?**

Yes. We will follow ethical and legal practice and all information about you will be handled in confidence.

**To access the study follow this link:**

[https://cccusocialsciences.az1.qualtrics.com/SE/?SID=SV\\_byGWko0Qed63axD](https://cccusocialsciences.az1.qualtrics.com/SE/?SID=SV_byGWko0Qed63axD)

**Additional information:**

**What will happen if I don't want to carry on with the study?**

If you withdraw from the study, we would not use the data collected up to your withdrawal.

**What if there is a problem?**

If you have a concern about any aspect of this study, please contact me via email ([s.d.landau431@canterbury.ac.uk](mailto:s.d.landau431@canterbury.ac.uk)) and I will do my best to answer your questions. If you remain unhappy and wish to someone else / make a complaint, you can do this by contacting the Salomons Centre for Applied Psychology and ask to speak to my supervisor, Dr Fergal Jones. Details can be obtained from <https://www.canterbury.ac.uk/social-and-applied-sciences/salomons-centre-for-applied-psychology/salomons-centre-for-applied-psychology.aspx>

**Will my results be kept confidential and what will be done with them?**

Yes, all information which is collected about you during the course of the research will be kept strictly confidential. Your data will be collected securely online and then stored on encrypted devices.

The data will then be used for statistical analyses with no identifying information. Only researchers on the project will have access to the data. It will be disposed of securely according to ethical guidelines.

**Who is organising, funding and reviewing the research?**

Canterbury Christ Church University.

## **2.5 Debrief information sent to participants following study and provided to university ethics committee to report on progress and completion of research**

### **Mindfulness Meditation Taster Study Debrief**

Thank you very much for participating in the Mindfulness Meditation Taster study. This email explains the purpose of the study and signposts where you might be able to continue exploring mindfulness meditation.

#### **What was the purpose of the study?**

To better understand the underlying therapeutic factors in mindfulness meditation. Specifically, we wanted to consider the 'story' that mindfulness tells – mindfulness meditation is both based in an ancient spiritual Buddhist tradition as well as being popularised and highly investigated in a secular scientific form. As such, we were interested in considering how the different stories that mindfulness meditation tells (spiritual and secular) might influence the way that people respond to it.

#### **How did the study investigate this?**

We made three different videos that introduced you, our participants, to mindfulness meditation. These videos either focused on the spiritual, secular or philosophically integrated nature of mindfulness. You were randomly assigned by the computer to only watch one of these videos. We also asked you to fill in a number of questionnaires to help us understand whether you are more spiritually or secularly disposed. We asked for outcome measures of your perceived credibility of- and expectations for- mindfulness meditation, your emotional state and your state mindfulness at three points in the study: prior to the introductory videos, after the introduction and after the brief mindfulness meditation practice. We charted any changes in these measures as well as considering whether these changes were affected by which introduction you saw and your disposition.

#### **What did we find?**

While the results are still being analysed, overall all participants improved in their perceived credibility for- and expectations of- mindfulness meditation across the time of the study. This was also reflected in increases in state mindfulness and reductions in negative emotional state. There were small effects of matching participants' disposition to their introduction video; more secular participants showed better outcomes when watching the secular introduction video than non-secular participants.

#### **What does this tell us?**

The results tell us that mindfulness meditation is broadly acceptable to a group of people, even when only presented in its spiritual or secular form. This may be because there is something effective about mindfulness meditation that transcends spiritual / secular divides or perhaps, even in its spiritual form, mindfulness meditation has become acceptable to society. The results also tell us that if it is possible to match a person's dispositional preferences to the therapy that they receive it might enhance outcomes.

**Where can I go to find out more about mindfulness meditation?**

The introductory videos and mindfulness meditation practice that was used in this study were obtained from the popular book 'Mindfulness: a practical guide to finding peace in a frantic world' by Mark Williams and Danny Penman. This is a very helpful book that guides the reader through a course in mindfulness meditation. There is a lot of other material readily available on the internet and in apps. Local services and charities may also offer mindfulness meditation courses.

**If I have any further questions, who can I contact?**

Please email the primary researcher of the study, Samuel Landau: [s.d.landau431@canterbury.ac.uk](mailto:s.d.landau431@canterbury.ac.uk) with any further questions.

Thank you again for your kind participation in this study.

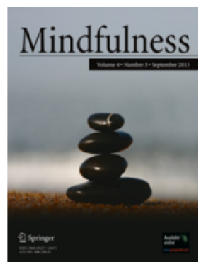
## Appendix 3. Instructions to authors from 'Mindfulness' Journal (proposed journal for submission of Part B)

Psychology - Cognitive Psychology | Mindfulness - incl. option to publish open access

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### Mindfulness

Editor-in-Chief: Nirbhay N. Singh  
ISSN: 1868-8527 (print version)  
ISSN: 1868-8535 (electronic version)  
Journal no. 12671



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## Instructions for Authors

### EDITORIAL PROCEDURE

#### Double-blind peer review

This journal follows a double-blind reviewing procedure. Authors are therefore requested to submit

A blinded manuscript without any author names and affiliations in the text or on the title page. Self-identifying citations and references in the article text should be avoided.

A separate title page, containing title, all author names, affiliations, and the contact information of the corresponding author. Any acknowledgements, disclosures, or funding information should also be included on this page.

### MANUSCRIPT SUBMISSION

#### Manuscript Submission

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⚠ Save your file in docx format (Word 2007 or higher) or doc format (older Word versions).

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LaTeX macro package (zip, 182 kB)

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Please use the standard mathematical notation for formulae, symbols etc.:

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Roman/upright for numerals, operators, and punctuation, and commonly defined functions or abbreviations, e.g., cos, det, e or exp, lim, log, max, min, sin, tan, d (for derivative)

Bold for vectors, tensors, and matrices.

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#### Citation

Cite references in the text by name and year in parentheses. Some examples:

Negotiation research spans many disciplines (Thompson 1990).

This result was later contradicted by Becker and Seligman (1996).

This effect has been widely studied (Abbott 1991; Barakat et al. 1995; Kelso and Smith 1998; Medvec et al. 1999).

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Harris, M., Karper, E., Stacks, G., Hoffman, D., DeNiro, R., Cruz, P., et al. (2001). Writing labs and the Hollywood connection. *Journal of Film Writing*, 44(3), 213–245.

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Slifka, M. K., & Whitton, J. L. (2000). Clinical implications of dysregulated cytokine production. *Journal of Molecular Medicine*, doi:10.1007/s001090000086

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Calfee, R. C., & Valencia, R. R. (1991). *APA guide to preparing manuscripts for journal publication*. Washington, DC: American Psychological Association.

⌘ Book chapter

O'Neil, J. M., & Egan, J. (1992). Men's and women's gender role journeys: Metaphor for healing, transition, and transformation. In B. R. Wainrib (Ed.), *Gender issues across the life cycle* (pp. 107–123). New York: Springer.

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EndNote style (zip, 3 kB)

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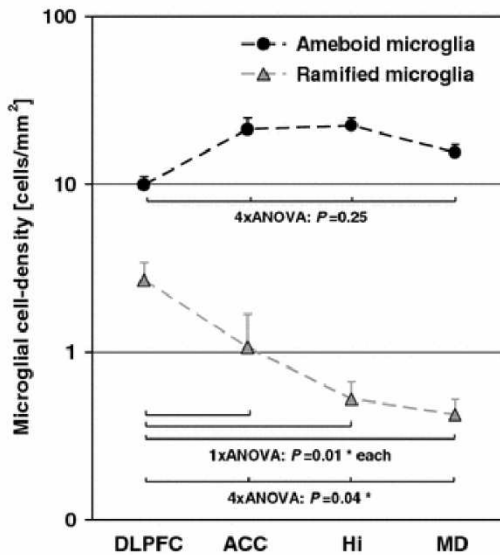
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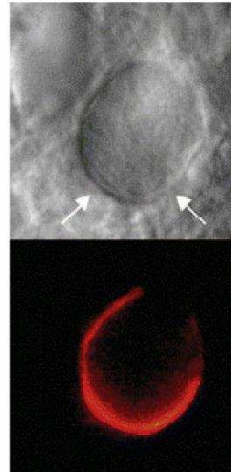
### Line Art



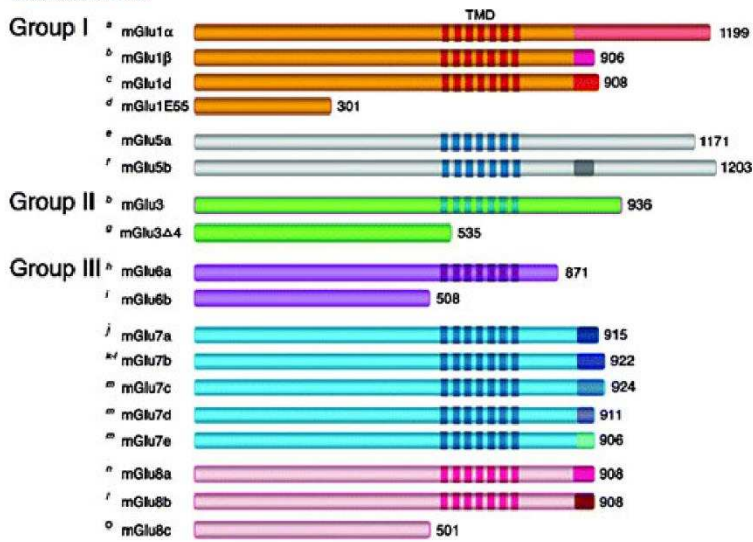
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