

Research Space

Journal article

Secular and spiritual “myths” of mindfulness-based programs: the effects of role inductions on a brief mindfulness-based intervention.

Landau, S. D., Barker, C., Pistrang, N. and Jones, F. W.

This is the author's accepted version of : Landau, S.D., Barker, C., Pistrang, N. *et al.* Secular and Spiritual “Myths” of Mindfulness-Based Programs: the Effects of Role Inductions on a Brief Mindfulness-Based Intervention. *Mindfulness* (2022).

<https://doi.org/10.1007/s12671-022-01930-7>

For the version of record, see: Landau, S. D., Barker, C., Pistrang, N., & Jones, F. W. (2022). Secular and spiritual “myths” of mindfulness-based programs: the effects of role inductions on a brief mindfulness-based intervention. *Mindfulness*. <https://doi.org/10.1007/s12671-022-01930-7>

Secular and spiritual “myths” of mindfulness-based programs: The effects of role-inductions on a brief mindfulness-based intervention.

S. D. Landau

Department of Clinical, Educational and Health Psychology, University College London, London, UK

ORCID: 0000-0003-1445-2772

C. Barker

Department of Clinical, Educational and Health Psychology, University College London, London, UK

ORCID: 0000-0002-9268-9356

N. Pistrang

Department of Clinical, Educational and Health Psychology, University College London, London, UK

ORCID: 0000-0002-7872-8152

F. W. Jones (corresponding author)

Salomons Institute for Applied Psychology, Canterbury Christ Church University, 1 Meadow Road, Tunbridge Wells, Kent, TN1 2YG, UK

e-mail: fergal.jones@canterbury.ac.uk

ORCID: 0000-0001-9459-6631

Abstract

Objectives: Mindfulness meditation has both spiritual and secular foundations. Drawing on Jerome Frank's concept of a healing “myth”, this study investigated the relative influence of spiritual and secular inductions to a brief mindfulness-based intervention. We hypothesized that, compared to narrower spiritual or secular presentations, an integrated role induction to mindfulness meditation would be more effective at improving the perceived credibility of, and expectations regarding, this practice, and would hence result in a subsequent mindfulness practice having a greater effect on state mindfulness and affect. We also hypothesized that there would be congruency effects between participants’ dispositional spirituality/secularity and their assigned induction group.

Methods: Participants (n=179) were randomly allocated to one of three role inductions (spiritual, secular or integrated); all then received the same brief, online, mindfulness intervention. Dispositional measures of secularity and spirituality were taken at baseline, and state measures of credibility and expectations, mindfulness and affect were taken at baseline, post-induction and post-intervention.

Results: Following attrition and screening for participation, data from 124 completers were analysed. Participants improved across time on measures of credibility and expectations, state mindfulness and negative affect. Contrary to the hypotheses, the integrated induction group did not improve more than the secular or spiritual groups, nor were congruency effects found. However, there was significantly less participant attrition in the integrated group than the other two conditions.

Conclusions: It is argued that a more broadly accessible “myth” may help more participants to persevere with mindfulness practice.

Keywords:

Mindfulness; Meditation; Religious; Spiritual; Secular

Frank (1973) theorized that all physical health and mental health treatments have their characteristic rationale or “myth”, i.e. the practitioner’s explanation for why the treatment will work. The term was not intended to be pejorative: such myths apply not only to treatments lacking an evidence base, but also to established psychological therapies. It has been argued that the “myth” that helps make sense of the patient’s distress forms a key common factor when looking at the components common to all psychotherapeutic interventions that are drivers of change, as opposed to intervention-specific factors (see Wampold 1997; 2012). Frank proposed that a treatment’s myth will induce positive client expectations, which may partly account for the treatment’s effectiveness. Clients’ expectations are thought to have two components, their perceived credibility of the intervention and their expectation for improvement, which can be predictive of therapy outcomes (Borkovec & Nau 1972; Greenberg et al. 2006). The credibility and expectations for an intervention can be influenced via role-induction, that is presenting the context, rationale or “myth” of therapy (Walitzer et al. 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.

The role that therapy myths (Frank, 1973) may play in relation to mindfulness-based programs (MBPs; Crane et al. 2017) is arguably of particular interest, because MBPs have their roots in both ancient Buddhist spiritual tradition and secular science and therapy (Segal et al. 2002; Williams & Kabat-Zinn 2011). MBPs have been described 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, p. 992). In other words, MBPs’ “myth” rests on both spiritual and secular foundations. Kabat-Zinn’s (2017) mindfulness-based stress reduction (MBSR) was intentionally developed to be “a skillful means for making the universal essence of dharma [the teachings of the Buddha], or at least a first taste of it, accessible to virtually anybody who cared to explore it” (p. 1126). Thus, the secular MBSR program was heavily influenced by a spiritual/religious tradition, namely Buddhism, both in terms of its theoretical understanding regarding the causes and alleviation of human suffering and the practices taught to aid this (Kabat-Zinn 2017). Despite this broad myth basis across spiritual and secular sources, the spiritual heritage of secular MBPs is often not stressed, with MBPs deployed in multiple secular settings such as the workplace, schools, prisons and healthcare (Pepping et al. 2016).

Some authors have questioned whether MBPs can be ethically or effectively separated from their original Buddhist context (e.g. Brazier 2013) arguing that the secularization of ideas and practice derived from Buddhism means MBPs lose some of their meaning and capacity to liberate from suffering through reinforcing individualism and value-free techniques (e.g. Grossman 2011; Marx 2015). Others consider mindfulness as an inherent human capacity that can be practiced outside of any one specific faith tradition (Brown et al. 2011). Nevertheless, a recent meta-analysis of exclusively secular MBPs demonstrated that they generate increases in self-reported spirituality compared to both passive and active controls (Landau & Jones 2021). This suggests that, while secular MBPs may not contain explicit spiritual components, since they leave “behind ... religious, esoteric and mystical elements” (Crane et al. 2017, p. 992), secular mindfulness practice nevertheless nurtures the development of spirituality.

Previous studies comparing spiritual and secular meditation have yielded mixed findings. Adding explicit spiritual references to transcendental meditation (TM) was associated with greater improvements in outcomes compared to secular TM, though these findings cannot be assumed to generalize to mindfulness meditation (Wachholtz & Pargament 2005). On the other hand, a study of people with migraines found that manipulating the content of an MBP to be more or less spiritual had no influence on participants' performance on a cold pressor task (Feuille & Pargament 2015). One thing that is clear, however, is that the interface between the therapeutic and spiritual dimensions of MBPs is a relatively under-researched area deserving of further attention (cf. Kristeller & Jordan 2018; Landau & Jones 2021).

Since MBPs integrate both spiritual and secular philosophies to an extent, it is possible they allow an individual to locate their own explanatory preferences, be they spiritual or secular, within the myth of the program. Furthermore, it is plausible that individual differences in participant preferences for secular versus spiritual explanations can interact with the framing of an MBP to influence its perceived credibility and participant expectations, which in turn could impact MBP outcomes (cf. Borkovec & Nau 1972; Greenberg et al. 2006).

Given this, the present study focused on credibility and expectations resulting from how the myth of mindfulness is presented. Unlike previous research, which has manipulated mindfulness intervention content, this study aimed to examine the effect of manipulating intervention context, through changing a pre-intervention role induction. It was hypothesized that a philosophically-integrated role induction would result in greater improvements in credibility and expectations than either a secular, science-based induction or a spiritual (Buddhist-derived) induction (Hypothesis 1a) and that participants who received the former would show greater

improvement in state mindfulness and affect following a subsequent brief, online mindfulness practice (Hypothesis 1b). In addition, it was hypothesized that participants whose dispositional preferences were 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 were allocated to an induction that was incongruent with their dispositional preferences (e.g. secular participants in the spiritual role-induction group) (Hypothesis 2).

Method

Participants

Adult participants were recruited from social media, via emails to available distribution lists, and from a large urban university's participant pool. Of the 236 people who clicked on the study link, 205 consented to participate, of whom 11 dropped out immediately. The remaining 194 provided demographic information: this sample was mostly female ($n=160$; 82.5%) with a mean age of 26.0 years ($SD=12.56$) and the majority were students (see online supplementary material for further details). 165 participants completed the final measures, of whom 124 completed the study within an appropriate amount of time; i.e. not implausibly quickly (<20 mins) or implausibly slowly (>80 mins). Table 1 provides demographic information for the 124 completers and Figure 1 illustrates participant flow.

51 (85%) of the 60 participants randomized to the integrated induction condition completed the study and did so within a plausible amount of time (i.e. ≥ 20 mins and ≤ 80 mins). By contrast, only 34 (58%) of the 59 participants in the secular induction condition and 39 (65%) of the 60 participants randomized to the spiritual induction condition did the same. This difference was statistically significant ($\chi^2(2)=11.25$, $p<.01$), with the rate of completion in the integrated condition being significantly higher than in both the secular ($\chi^2(1)=10.92$, Bonferroni corrected $p<.003$) and spiritual ($\chi^2(1)=6.40$, Bonferroni corrected $p=.033$) conditions, while the latter two did not significantly differ ($\chi^2(1)=0.68$, Bonferroni corrected $p=1$). One possibility is that participants who dropped out from the study, or took an implausibly short or long time to complete it, may have held lower credibility and expectations in relation to mindfulness. However, contrary to this, study completion (within a plausible amount of time) was not significantly associated with baseline (T1) credibility-expectancy questionnaire (CEQ) scores (completers vs. non-completers: $t(191)=1.36$, $p=.18$). Furthermore, the difference in post-induction (T2) CEQ scores between completers and non-completers just failed to reach significance (completers: mean=32.35, $SD=9.09$, $n=124$; non-completers: mean=29.25, $SD=9.66$, $n=48$; $t(170)=1.97$, $p=.05$).

There were no previous studies sufficiently like the current one from which an effect size and rate of participant attrition could be estimated in order to anchor an a priori power calculation. However, a small to medium effect size was considered an appropriate and pragmatic target based upon the relatively short length of the induction and intervention. G*Power (version 3; Faul et al. 2007) indicated that the final sample size of N=124, after attrition, was sufficient to detect a small to medium effect size ($f=0.14$) with a power of 0.80 and an alpha of 0.05, for the interaction term in a three group by two time-point ANOVA. The study was approved by a university research ethics committee and all participants provided informed consent.

Procedure

Design. The study used a 3x3 experimental design, with a between-participant factor of role-induction group (integrated, secular and spiritual) and a repeated measure factor of time point (baseline [T1], post-induction/pre-intervention [T2] and post-intervention [T3]). The dependent variables were credibility, expectations of benefit, state mindfulness and affect. The study was delivered online using Qualtrics (<http://www.qualtrics.com>) with embedded YouTube videos of the induction and intervention. Participants accessed the study on their own internet enabled devices.

Administration. Participants began by granting informed consent and recording any previous experience of meditation. They then progressed to pre-measures of demographics (age, gender, ethnicity, academic achievement, and religion), trait variables (spirituality and secularity) and baseline state variables (credibility and expectations, mindfulness, and affect). Following these baseline measures, they were randomly assigned by Qualtrics, with equal probability, to one of three role-induction groups. After the induction, the state measures were repeated. All the participants then viewed the same video, which guided them through a mindfulness meditation practice, before completing the state measures again, followed by a final participation check (see measures section). All participants who reached the end of the study were offered free entry to a prize draw for a £50 Amazon voucher, as a “thank you” for participation. University students who reached the end of the study were additionally offered course credit. The study lasted approximately 45 minutes.

Induction and intervention videos. The induction videos lasted approximately six minutes each and were created 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 *Mindfulness: a practical guide to finding peace in a frantic world* (Williams & Penman 2011). This book was selected for several reasons: first, it draws on the principles of mindfulness-based cognitive therapy, which has a strong evidence-

base (e.g. Kuyken et al. 2016); second, the book itself has some evidence to support its efficacy (Lever Taylor et al. 2014); and third, it has been written to be understandable and engaging for the general public. Sections that focused on either the spiritual or secular/scientifically-based aspects of MBPs 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. The three scripts were matched in length and were selected so that they were similar in tone and salience. An example from the spiritual script is as follows: “[The happiness resulting from mindfulness meditation 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 is: “Clinical trials show that it [mindfulness meditation] 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 intervention video was “Mindfulness of the Body and Breath” also from Williams and Penman (2011). This was an eight-minute audio track publicly available on YouTube that guided participants through the stages of settling, bringing awareness to the body, focusing on sensations of breathing, and responding skillfully to mind-wandering.

Measures

Functional Assessment of Chronic Illness Therapy-Spiritual Wellbeing (FACIT-Sp: Peterman et al. 2002). This 12-item questionnaire was originally designed to explore aspects of spirituality in populations with chronic illness, but has also been used successfully in community samples (e.g. Birnie et al. 2010). Respondents record on a five-point Likert-type scale how true statements have been for them over the past seven days (e.g. “I find comfort in my faith or spiritual beliefs”). In accordance with other studies, the last two items were altered to more appropriately fit non-illness populations (Birnie et al. 2010). The FACIT-Sp produces a total score for spiritual wellbeing, which has demonstrated good internal consistency in community samples (e.g. $\alpha=0.90$; Colgrove et al. 2007) and in the current study ($\alpha=0.88$; McDonald’s $\omega=0.85$).

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-type scale. It is currently the only measure of secularity as an independent construct to spirituality, i.e. not on a continuum with spirituality. The original questionnaire was normed and validated on a German speaking population and translated into English by its author. Its subscales have good

internal consistency in the current study ($\alpha > 0.79$; McDonald's $\omega > 0.80$) and historically ($\alpha > 0.75$; Schnell 2015). Owing to the possible construct overlap between the humanism and personal responsibility subscales on the one hand, and religious / spiritual markers on the other, only the atheism, agnosticism and scientism subscales were used in the present study (Schnell 2015). Furthermore, based on the factor structure observed by Schnell (2015), these subscales were treated as separate variables, rather than combined into a total score.

Credibility / Expectancy Questionnaire (CEQ: Borkovec & Nau 1972). This five-item measure asks respondents to rate the credibility of, 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 overall scale has an alpha of 0.84 historically (Deville & Borkovec 2000) and, in the current study, $\alpha = 0.91$ and McDonald's $\omega = 0.92$. In accordance with other studies, the questions were modified to refer to mindfulness as the intervention in question (e.g. Nock et al. 2006).

State Mindfulness Scale (SMS: Tanay & Bernstein 2013). This 21-item questionnaire measures mindfulness as a state-like mental behavior. Respondents record on a five-point Likert-type scale how well statements (e.g. "I was aware of different emotions that arose in me") describe their recent experiences. The original scale asks respondents to consider their experience over the past 15 minutes. As this would have caused overlap between study time points, the instructions were altered to ask respondents to consider their experiences over the past 5 minutes. Both the original version and the version employed in the current study have good internal consistency, respectively $\alpha = 0.89$ (Tanay & Bernstein 2013) and $\alpha = 0.95$ and McDonald's $\omega = 0.94$.

Positive and Negative Affect Scale -short form (PANAS: Watson et al. 1988). This questionnaire consists of two 10-item subscales that separately assess positive and negative affect. The PANAS can measure the immediate effects of an intervention and provides a proxy for wellbeing ratings that is sensitive to change over short time periods (e.g. McClintock & Anderson 2015). Respondents are provided with a list of positive and negative affect words (e.g. "excited", "upset") and are asked to indicate on a five-point Likert-type scale how much they feel this way right now. Both the positive and negative scales showed high internal consistencies in the current study ($\alpha = 0.88$ and 0.90 respectively; and McDonald's $\omega = 0.87$ and 0.91 respectively) and historically ($\alpha = 0.89$ and 0.85 respectively; Watson et al. 1998). A higher score on each subscale indicates increased presence of positive or negative affect, with a small, negative correlation ($r = -.15$) between the two scales.

Engagement. At the end of the study, participants were asked to rate how much they engaged with the mindfulness practice on a five-point Likert-type scale (1=A great deal, 2=A lot, 3=A moderate amount, 4=A little, 5= Not at all).

Data analyses

Data were downloaded from Qualtrics and analyzed using IBM SPSS, including the PROCESS macro (Hayes 2013). Qualtrics was configured to require that all data fields were completed, so for participants who finished the study, there were no missing data beyond the FFMQ items mentioned above. The analyses included ANOVA, planned contrasts, bias corrected bootstrapped moderation and residual gain analysis, as detailed in the results section. Unless otherwise stated, the analyses were conducted on the sample of 124 participants who completed the study within a plausible amount of time. Where indicated, the p-values have been adjusted to control for multiple comparisons by applying the Bonferroni correction (Jafari & Ansari-Pour 2019).

Results

Preliminary analyses

All continuous variables were approximately normally distributed apart from the negative affect subscale of the PANAS. As a precaution, the below ANOVA analyses with PANAS-negative as the dependent variable were repeated using non-parametric methods (i.e. the Wilcoxon signed-rank matched pairs test for the main effect of time, the Kruskal–Wallis test for the main effect of group, and a Kruskal–Wallis test on change scores for the group by time interaction). The significance/non-significance of the findings remained unchanged, suggesting that the deviation from normality had not led to artefactual PANAS-negative findings, and hence that the ANOVA results reported below stand. No baseline (T1) variables significantly differed across the induction groups (all Bonferroni corrected p-values >.1). Descriptive statistics and inter-correlations for baseline measures are given in Table 2.

Main analyses

Means and standard deviations for the state measures across time points are shown in Table 3. Hypothesis 1a predicted that the integrated induction group would generate the greatest improvements in credibility and expectations post-induction. To test this, a group (integrated vs. secular vs. spiritual) by time (pre-induction [T1] vs. post-induction/pre-intervention [T2]) ANOVA was run, with CEQ as the dependent variable. This showed that credibility-expectancy scores improved from pre to post induction (main effect of time: $F(1,121) = 12.14, p = .001, \eta_p^2 = .091$), but there was no evidence for the integrated induction having a

different effect on credibility-expectancy than the other two groups (group X time: $F(2,121) = 0.06$, $p = .94$, $\eta_p^2 = .001$). Furthermore, orthogonal planned contrasts on T2 minus T1 change scores confirmed that the integrated group did not significantly differ from the other two groups ($t(121) = 0.06$, Bonferroni adjusted $p = 1$, $g = .02$) and that the secular and spiritual groups also did not significantly differ ($t(121) = 0.33$, Bonferroni adjusted $p = 1$, $g = .08$). To check whether differential attrition and exclusion across the groups may have impacted these findings, the primary (three group) ANOVA analysis was repeated with all 172 participants who were in the study at Time 2, regardless of whether they met the criterion of completing the study in between 20 and 80 minutes. As previously, credibility-expectancy scores significantly increased pre to post induction ($F(1,169) = 15.17$, $p < .001$, $\eta_p^2 = .082$) and this change did not significantly differ across the groups ($F(2,169) = 0.15$, $p = .86$, $\eta_p^2 = .002$). Thus, no support for Hypothesis 1a was observed.

Hypothesis 1b predicted that the integrated group would generate the greatest improvements in state mindfulness and affect outcomes from pre to post mindfulness intervention. This was tested using group (integrated vs. secular vs. spiritual) by time (post-induction/pre-intervention [T2] vs. post-intervention [T3]) ANOVAs, with SMS, PANAS positive and PANAS negative as the respective dependent variables. These showed that state mindfulness increased from pre to post intervention (SMS main effect of time: $F(1,121) = 182.10$, $p < .001$, $\eta_p^2 = .601$); that the trend for an increase in positive affect just failed to reach significance (PANAS positive main effect of time: $F(1,121) = 3.50$, $p = .064$, $\eta_p^2 = .028$); and that negative affect significantly decreased from before to after the mindfulness intervention (PANAS negative main effect of time: $F(1,121) = 9.30$, $p = .003$, $\eta_p^2 = .071$). However, perhaps unsurprisingly in light of the failure to confirm Hypothesis 1a, these ANOVAs provided no evidence of a differential effect of the mindfulness intervention across groups, on the SMS, PANAS positive or PANAS negative measures (see Table 4). Furthermore, for all three outcomes, planned contrasts on T3 minus T2 change scores showed that the integrated group did not significantly differ from the other two groups (Table 4). Thus, Hypothesis 1b was also not supported.

Turning to Hypothesis 2, in order to determine whether there was a congruency effect between participants' dispositional preferences and the role induction, with respect to change in credibility and expectancy following the induction, a bootstrapped moderation analysis was conducted on the data from the spiritual and secular groups. The independent variable was group (spiritual vs. secular), the moderator was spirituality (as measured by the FACIT-Sp), the dependent variable was post-induction/pre-intervention (T2) CEQ, and pre-induction (T1) CEQ was included as a covariate. As can be seen from Table 5, there was no evidence of a congruency effect, as the interaction between spirituality and group was not significant. This

analysis was repeated separately for each of the three subscales of the DoS (since these subscales cannot be combined to form a total score), with the respective subscale being included as the putative moderator in each case. None of these subscales significantly interacted with group (Table 5).

To examine whether the hypothesized congruency effects could be observed in the change in state mindfulness following the mindfulness practice, the above analyses were repeated but with post-intervention (T3) state mindfulness as the dependent variable and post-induction/pre-intervention (T2) state mindfulness as the co-variate. Again, as can be seen from Table 5, none of the interactions were significant. The same was the case when the positive subscale of the PANAS was the outcome and covariate, and for the negative subscale of the PANAS (see Table 5). Thus, there was no evidence of a congruency effect between participants' dispositional preferences and the role induction, with respect to change in credibility-expectancy, change in state mindfulness or change in mood state, and so Hypothesis 2 was not supported.

Additional Checks

The study was based on an assumption that higher CEQ scores would predict greater improvement over the course of the mindfulness intervention. This assumption was supported by the data, as a residual gain analysis found that post-induction/pre-intervention (T2) CEQ scores predicted post-intervention (T3) SMS scores, when controlling for post-induction/pre-intervention (T2) SMS scores ($F(1,121) = 24.51, p < .001, \Delta R^2 = .075$), indicating that higher credibility-expectations post-induction predicted greater gain in state mindfulness following the mindfulness practice.

The median value of participants' self-reported level of engagement with the mindfulness practice was 2 (“a lot”), with an IQR of 1.75 (from 1.25, “a great deal”, to 3, “a moderate amount”). Only one participant (0.8%) reported “not at all” engaging in the mindfulness practice. Note that this apparent relatively high level of engagement may be because, as with the other analyses, these data are from the 124 participants who completed the study and did so within a reasonable amount of time. To check whether degree of engagement interacted with any of the above-reported ANOVA findings, the previous ANOVAs were repeated with an additional factor (engagement) included. This factor collapsed those who reported engaging “a great deal”, “a lot” or “a moderate amount” into one level, and those who reported engaging “a little” or “not at all” into another level. Engagement did not significantly interact with any of the above-reported ANOVA findings (all Bonferroni corrected p-values $>.07$).

The same process was repeated to check whether prior meditation experience (some vs. none) significantly interacted with any of the ANOVA findings. It did not (all Bonferroni corrected p-values $>.8$).

Finally, given that a substantial proportion of the sample was students and that, unlike other participants, students had the option of receiving course credit, the factor student status (student vs. non-student) was examined in the same manner. In all but one case, student status did not significantly interact with the above-reported ANOVA findings (Bonferroni corrected p -values $>.3$). The only significant interaction was that in the ANOVA that only included the spiritual and integrated conditions, and for which CEQ was the dependent variable, non-students showed a significantly greater increase in credibility-expectation pre (T1) to post (T2) induction than students did (time X student status: $F(1,86)=12.47$, Bonferroni corrected $p<.05$). This appeared to be driven by the students having higher baseline (T1) CEQ scores than non-students, resulting in a small degree of change.

Discussion

This study compared the effectiveness of secular, spiritual and philosophically integrated role-inductions or “myths” (Frank, 1973), as well as possible congruency effects with spiritual/secular dispositions, on expectations, credibility and outcomes for a brief online mindfulness meditation intervention. All three induction groups improved across time points on measures of credibility and expectations, state mindfulness and negative affect, but this improvement was similar for all three groups. Contrary to the hypotheses, the integrated induction group did not improve more than the secular or spiritual induction groups and congruency effects were not observed.

A significantly higher proportion of the integrated group successfully completed the study than of the other two groups. While selective participant attrition is frequently viewed as a threat to the validity of studies (Buhrmester et al. 2018; Zhou & Fishbach 2016), in the current case it may be an important outcome, albeit a tentative one, given that it was not predicted in advance.

The findings are consistent with the possibility that using a “myth” that is intended to be more broadly accessible, through appealing to a greater range of personal dispositions (i.e. the integrated induction), helped participants to appropriately persevere with the study, and that those who were able to persevere then accrued similar benefit and manifested similar credibility and expectations, regardless of their group. The findings suggest that the framing of MBPs is an important area for future research and, drawing on them, it would seem reasonable to base such research on the hypothesis that broadly accessible framing that draws on both secular and spiritual content could reduce attrition from MBPs. This seems particularly relevant to self-help and online MBPs that involve minimal or no contact with a mindfulness-teacher, as attrition can be a particular issue with this format, and also because there is not the possibility of a teacher adjusting the framing on a participant-by-

participant basis. However, care would be needed when developing broad framings, in order to minimize the risk of included elements being off-putting for some participants (e.g., religious material).

Regarding the failure to find congruency effects between the nature of the induction and participants' spiritual/secular dispositions, it may be that the assumption of a clear boundary between spirituality and secularity was flawed. Specifically, all three induction videos in the current study stressed “finding peace in a frantic world”, having been scripted from the Williams and Penman (2011) book, which includes this phrase in its title. The “myth” of finding peace can be viewed as both something secular and something spiritual, with some measures of spirituality including “peace” (FACIT-sp; Peterman et al. 2002). Relatedly, Carlson et al. (2016) found the dimension of peace to be the main source of increases in spirituality following an MBP. The concept of finding peace might be an equally appropriate and compelling myth for a self-identifying non-spiritual person, just as much as for a self-identifying spiritual person. It could be that both secular and spiritual participants connected with this “peace” aspect of the inductions.

The absence of congruency effects between participants' disposition and induction condition is in line with recent findings that neither baseline spirituality nor religious affiliation moderated the reduction in depressive symptoms following an MBP, despite increases in spirituality being associated with a reduction in depressive symptoms (Greeson et al. 2015). It also fits with Bowen et al.'s (2015) finding that when meditation was taught in a traditional Buddhist Vipassana context to members of other religious/spiritual backgrounds (i.e. spiritually incongruent participants), involvement in the course was not associated with religious identification or level of engagement prior to taking the course, or with subsequent engagement in religious practices. These findings suggest that mindfulness 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 mindfulness meditation does not necessarily depend upon whether one is predisposed to a more spiritual or secular myth, perhaps because the compelling myth of finding peace is primary.

This may have some bearing on the debate regarding whether MBPs can ethically or effectively be separated from their Buddhist context. Some authors have raised concerns that secular MBPs lose meaning and the capacity to liberate from suffering by over-emphasizing acceptance and meditation, thereby reinforcing individualism and value-free techniques (e.g. Grossman 2011; Marx 2015). Others argue that mindfulness is an inherent human capacity that can be practiced outside of any one specific faith tradition (Brown et al. 2011). The suggestion, from the current study, that the myth of MBPs has a broad appeal across spiritually and secularly disposed individuals lends support to offering MBPs outside of their originating Buddhist context.

While no effects of congruency or induction type, beyond that on attrition, were observed in the current study, higher credibility and expectations post-induction/pre-intervention predicted greater gain in state mindfulness following the subsequent mindfulness practice. This is consistent with previous research that has suggested that expectancy and credibility are associated with psychotherapy outcomes (Greenberg et al. 2006) and underlines the importance of attending to these prior to MBPs.

The association between perceived credibility and expectations for any therapeutic intervention and positive outcomes is often considered within a common factors approach to understanding the active processes of therapeutic interventions (Wampold 1997). While MBPs have arguably rarely been considered through a common factors lens, under the assumption that the techniques of MBPs are the primary agent of change, this process has started (e.g. Canby et al. 2021). Considering common factors, such as role induction, seems likely to be a valuable focus for future MBP research. This could helpfully include examining whether the current finding that an integrated induction reduces attrition replicates and generalizes to other samples and to MBPs, especially those offered via self-help.

Limitations and Future Research

The study had several limitations. First, it is possible that the length and quality of the role induction and/or the mindfulness practice may have been insufficient to produce group differences, other than in attrition. Second, the brevity and online delivery of the mindfulness intervention limits generalizability to MBPs. Third, the reliance on only self-report measures may have given rise to common methods bias. Specifically, the observed correlations between constructs may have been artefactually inflated by response styles, social desirability and/or priming effects that were common across the self-report measures (cf. Podsakoff et al. 2012). Fourth, the repetition of the measurement of state credibility-expectancy, mindfulness and affect may have led to repetition effects that artefactually altered participants' scores. Fifth, the sample was not representative of the broader population, for example, due to a high proportion of women and students. Sixth, student participants were offered an additional incentive that the other participants were not (though this does not appear to have meaningfully altered the findings, as, except for in one case, student status did not interact with the ANOVA results). Seventh, concerns have been raised regarding the construct validity of spirituality measures, especially given the changing approaches to what spirituality means within societies (Koenig 2008). Eighth, while the Bonferroni correction controls the risk of Type 1 errors, it is relatively conservative and increases the risk of Type 2 errors. Ninth, the induction materials were not prepared by someone who was blind to the hypotheses.

Future research could helpfully test the hypothesis that, in a replication of this study, the integrated induction group would show least attrition. Assuming this were found, it could then be helpful to examine the hypothesis that engagement in MBPs would be higher when they are accompanied by an integrated framing or “myth”, rather than a solely secular or spiritual one.

Conflict of Interest: The authors declare no conflict of interest.

Ethics: Ethical approval was provided by the Salomons Ethics Committee, Salomons Institute, Canterbury Christ Church University. All participants provided informed consent.

Author Contribution: SL designed and executed the study, led the data analysis and interpretation, wrote the first draft of the manuscript and collaborated in redrafting. CB and NP: collaborated in the design, interpretation and writing up of the study. FWJ: collaborated in the design, data analysis, interpretation and writing up of the study.

Data Availability Statement: The data are not available in a public repository, as permission for this was not sought from the participants. However, they are available from the corresponding author upon reasonable request.

Acknowledgments and Funding: The study received no external funding. The first author was at Canterbury Christ Church University when the data were collected.

References

- 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>
- 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>
- 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>
- Buhrmester, M. D., Talaifar, S., & Gosling, S. D. (2018). An evaluation of Amazon's Mechanical Turk, its rapid rise, and its effective use. *Perspectives on Psychological Science, 13*(2), 149-154.
<https://doi.org/10.1177/1745691617706516>
- Canby, N. K., Eichel, K., Lindahl, J., Chau, S., Cordova, J., & Britton, W. B. (2021). The contribution of common and specific therapeutic factors to mindfulness-based intervention outcomes. *Frontiers in Psychology, 11*, 3920. <http://doi.org/10.3389/fpsyg.2020.603394>
- 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>
- 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
- 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>
- Crawford, J. R., & Henry, J. D. (2004). The positive and negative affect schedule (PANAS): Construct validity, measurement properties and normative data in a large non-clinical sample. *British Journal of Clinical Psychology*, 43(3), 245-265. <https://doi.org/10.1348/0144665031752934>
- Devilley, 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)
- 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*. 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>
- Frank, J. (1973). *Persuasion and healing: A comparative study of psychotherapy (2nd ed.)*. Johns Hopkins University 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. *Journal of Alternative and Complementary Medicine, 21*, 166-174. <http://doi.org/10.1089/acm.2014.0285>
- 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>
- Hayes, A. F. (2013). *Introduction to mediation: A regression-based approach (2nd ed.)*. Guilford Press.
- Jafari, M., & Ansari-Pour, N. (2019). Why, when and how to adjust your p values? *Cell Journal, 20*, 604–607.
<https://doi.org/10.22074/cellj.2019.5992>
- Kabat-Zinn, J. (1990). *Full catastrophe living: Using the wisdom of your body and mind to face stress, pain, and illness*. Delacorte.
- 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>
- Koenig, H. G. (2008). Concerns about measuring “spirituality” in research. *Journal of Nervous and Mental Disease, 196*(5), 349-355. <http://doi.org/10.1097/NMD.0b013e31816ff796>
- Kristeller, J.L., & Jordan, K.D. (2018). Spirituality and meditative practice: research opportunities and challenges. *Psychological Studies, 63*, 130–9. <https://doi.org/10.1007/s12646-017-0391-0>
- Kuyken, W., Warren, F. C., Taylor, R. S., Whalley, B., Crane, C., Bondolfi, G., Hayes, R., Huijbers, M., Ma, H., Schweizer, S., Segal, Z., Speckens, A., Teasdale, J. D., Van Heeringen, K., Williams, M., Byford, S., Byng, R., & Dalgleish, T. (2016). Efficacy of mindfulness-based cognitive therapy in prevention of depressive relapse: An individual patient data meta-analysis from randomized trials. *JAMA Psychiatry, 73*, 565-74. <https://doi.org/10.1001/jamapsychiatry.2016.0076>
- Landau, S. D., & Jones, F. W. (2021). Finding the spiritual in the secular: A meta-analysis of changes in spirituality following secular mindfulness-based programs. *Mindfulness, 12*, 1567–1581.
<https://doi.org/10.1007/s12671-021-01600-0>

- Lever Taylor, B., Strauss, C., Cavanagh, K., & Jones, F. W. (2014). The effectiveness of self-help mindfulness-based cognitive therapy in a student sample: A randomised controlled trial. *Behaviour Research and Therapy*, *63*, 63-69. <http://dx.doi.org/10.1016/j.brat.2014.09.007>
- 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>
- McClintock, A. S., & Anderson, T. (2015). The application of mindfulness for interpersonal dependency: Effects of a brief intervention. *Mindfulness*, *6*, 243-252. <https://doi.org/10.1007/s12671-013-0253-3>
- Merz, E. L., Malcarne, V. L., Roesch, S. C., Ko, C. M., Emerson, M., Roma, V. G., & Sadler, G. R. (2013). Psychometric properties of the positive and negative affect schedule (PANAS) original and short forms in an African American community sample. *Journal of Affective Disorders*, *151*, 942-949. <https://doi.org/10.1016/j.jad.2013.08.011>
- 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>
- 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
- Podsakoff, P. M., MacKenzie, S. B., & Podsakoff, N. P. (2012). Sources of method bias in social science research and recommendations on how to control it. *Annual Review of Psychology*, *63*, 539-569. <https://doi.org/10.1146/annurev-psych-120710-100452>
- Schnell, T. (2015). Dimensions of secularity (DoS): An open inventory to measure facets of secular identities. *International Journal for the Psychology of Religion*, *25*, 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*. Guilford Press.

- Sulmasy, D. P. (2002). A biopsychosocial-spiritual model for the care of patients at the end of life. *The Gerontologist*, 42(suppl. 3), 24-33. http://doi.org/10.1093/geront/42.suppl_3.24
- 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>
- 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., 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, 203-215. <http://doi.org/10.1037/0033-2909.122.3.203>
- 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*. Piatkus.
- Zhou, H., & Fishbach, A. (2016). The pitfall of experimenting on the web: How unattended selective attrition leads to surprising (yet false) research conclusions. *Journal of Personality and Social Psychology*, 111(4), 493–504. <https://doi.org/10.1037/pspa0000056>

Table 1. Participant demographic characteristics for the final sample (N=124) and the integrated (n=51), secular (n=34) and spiritual (n=39) groups.

Demographic	Overall n (%)	Integrated n (%)	Secular n (%)	Spiritual N (%)	Group Comparison¹
Gender					
Female	104 (83.9)	44 (86.3)	30 (88.2)	30 (76.9)	$\chi^2(2)=3.90$, adj. p=.71
Male	17 (13.7)	5 (9.8)	3 (8.8)	9 (23.1)	
Another gender	3 (2.4)	2 (3.9)	1 (2.9)	0 (0)	
Ethnicity					
Asian / Asian British	29 (23.4)	13 (25.5)	9 (26.5)	7 (17.9)	$\chi^2(2)=0.69$, adj. p=1
Black / African / Caribbean / Black British	5 (4.0)	3 (5.9)	1 (2.9)	1 (2.6)	
Mixed / Multiple ethnic groups	6 (4.8)	1 (2.0)	1 (2.9)	4 (10.3)	
White	80 (64.5)	31 (60.8)	22 (64.7)	27 (69.2)	
Other	4 (3.2)	3 (5.9)	1 (2.9)	0 (0.0)	
Highest level of academic achievement					
GCSE / equivalent	3 (2.4)	3 (5.9)	0 (0.0)	0 (0.0)	$\chi^2(4)=6.17$, adj. p=.94
A level / equivalent	75 (60.5)	26 (51.0)	23 (67.6)	26 (66.7)	
Bachelor's degree	25 (20.2)	15 (29.4)	3 (8.8)	7 (17.9)	
Master's degree	18 (14.5)	7 (13.7)	7 (20.6)	4 (10.3)	
Doctoral degree	3 (2.4)	0 (0)	1 (2.9)	2 (5.1)	
Employment status					
Employee - part time	12 (9.7)	4 (7.8)	5 (14.7)	3 (7.7)	$\chi^2(2)=0.46$, adj. p=1
Employee - full time	16 (12.9)	10 (19.6)	2 (5.9)	4 (10.3)	
Self-employed	2 (1.6)	0 (0.0)	1 (2.9)	1 (2.6)	
Unemployed	5 (4.0)	1 (2.0)	2 (5.9)	2 (5.1)	
Full-time student	89 (71.8)	36 (70.6)	24 (70.6)	29 (74.4)	
Religion²					
Atheist (no religion)	39 (31.5)	14 (27.5)	12 (35.3)	13 (33.3)	$\chi^2(6)=4.39$, adj. p=1
Agnostic (not sure)	35 (28.2)	13 (25.5)	9 (26.5)	13 (33.3)	
Church of England / Anglican	5 (4.0)	2 (3.9)	1 (2.9)	2 (5.1)	
Roman Catholic	4 (3.2)	2 (3.9)	1 (2.9)	1 (2.6)	
Protestant	4 (3.2)	2 (3.9)	1 (2.9)	1 (2.6)	
Other Christian	6 (4.8)	3 (5.9)	0 (0.0)	3 (7.7)	
Shi'ite Muslim	1 (0.8)	0 (0.0)	1 (2.9)	0 (0.0)	
Sunni Muslim	6 (4.8)	4 (7.8)	1 (2.9)	1 (2.6)	
Jew	10 (8.1)	7 (13.7)	2 (5.9)	1 (2.6)	
Hindu	1 (0.8)	1 (2.0)	0 (0)	0 (0.0)	
Sikh	2 (1.6)	0 (0.0)	2 (5.9)	0 (0.0)	
Buddhist	6 (4.8)	2 (3.9)	2 (5.9)	2 (5.1)	
Other	5 (4.0)	1 (2.0)	2 (5.9)	2 (5.1)	

¹The adj. p-values are Bonferroni corrected for multiple comparisons, and the sub-groups with very low counts that violated the χ^2 test's requirements were omitted or collapsed to make it possible to conduct the tests.

²Categories for religion were based on the Royal Free Interview for Spiritual and Religious Beliefs (King et al. 2001).

Table 2. Descriptive statistics for, and inter-correlations between, the baseline (T1) measures for the sample that completed the study in an appropriate amount of time (n=124).

	Mean (SD)	CEQ	DoS Ath.	DoS Agno.	DoS Sci.	SMS	FACIT-sp	PANAS pos
CEQ	30.35 (8.51)							
DoS Ath.	14.08 (8.70)	0.003						
DoS Agno.	16.57 (7.65)	.195*	.257*					
DoS Sci.	10.87 (6.37)	0.005	.647**	.188*				
SMS	53.52 (17.81)	.275*	0.083	-0.016	0.096			
FACIT-sp	24.81 (9.14)	.184*	-.216*	-.216*	-0.123	.316**		
PANAS pos	23.94 (7.73)	.217*	0.009	0.010	0.080	.372**	.446**	
PANAS neg	14.44 (6.08)	0.031	-0.105	-0.006	-0.088	0.074	-.305*	-0.093

*p<.05 prior to the Bonferroni correction for multiple comparisons, but not after; **p<.05 after the Bonferroni correction; CEQ=Credibility / Expectancy Questionnaire; DoS=Dimensions of Secularity; Ath.=Atheism; Agno.=Agnosticism; Sci=Scientism; SMS=State Mindfulness Scale; FACIT-sp=Functional Assessment of Chronic Illness Therapy -Spiritual Wellbeing; PANAS=Positive and Negative Affect Scale-short form; pos=positive; neg=negative.

Table 3. Descriptive statistics of state measures for the three induction groups across time points.

Measure	Integrated (n = 51)	Secular (n = 34)	Spiritual (n = 39)
	Mean (SD)	Mean (SD)	Mean (SD)
CEQ T1	31.35 (7.81)	31.59 (7.50)	27.95 (9.84)
CEQ T2	33.41 (9.61)	33.82 (7.24)	29.69 (9.47)
CEQ T3	35.10 (9.94)	36.79 (7.21)	32.92 (9.74)
SMS T1	57.16 (18.53)	52.59 (18.45)	49.59 (15.66)
SMS T2	63.18 (19.20)	58.24 (18.79)	50.41 (19.74)
SMS T3	77.39 (19.76)	78.71 (21.82)	69.13 (20.63)
PANAS pos T1	24.31 (7.63)	23.44 (7.73)	23.90 (8.04)
PANAS pos T2	25.47 (9.40)	23.94 (8.77)	21.26 (7.91)
PANAS pos T3	25.96 (10.79)	24.74 (9.94)	22.74 (8.72)
PANAS neg T1	14.12 (6.02)	15.12 (6.26)	14.28 (6.13)
PANAS neg T2	12.06 (3.70)	12.24 (3.37)	12.31 (4.27)
PANAS3 neg T3	11.96 (3.86)	11.32 (2.29)	11.46 (3.01)

CEQ=Credibility / Expectancy Questionnaire; SMS=State Mindfulness Scale; FACIT-sp=Functional

Assessment of Chronic Illness Therapy -Spiritual Wellbeing; PANAS=Positive and Negative Affect Scale-

short form; pos=positive affect; neg=negative affect; T1=baseline; T2=post role-induction/pre-intervention;

T3=post intervention.

Table 4. The Group X Time (post-induction/pre-intervention [T2] vs. post-intervention [T3]) interactions from the Group by Time ANOVAs, and orthogonal planned contrast on T3 minus T2 change scores. The first contrast compared the integrated group with the other two, and the second compared the spiritual and secular groups.

Dependent Variable	ANOVA Group X Time	Planned Contrast Integrated vs. Rest	Planned Contrast Secular vs. Spiritual
SMS	F(2,121) = 2.16, p = .12, $\eta_p^2 = .034$	t(121) = 2.03, adj. p = .09, g = -.74	t(121) = 0.52, adj. p = 1, g = .12
PANAS pos	F(2,121) = 0.38, p = .68, $\eta_p^2 = .006$	t(121) = 0.66, adj. p = 1, g = -.24	t(121) = 0.55, adj. p = 1, g = -.13
PANAS neg	F(2,121) = 1.84, p = .16, $\eta_p^2 = .030$	t(121) = 1.92, adj. p = .11, g = .70	t(121) = 0.13, adj. p = 1, g = -.03

SMS= State Mindfulness Scale; PANAS=Positive and Negative Affect Scale-short form; pos=positive affect;

neg=negative affect; adj. p = Bonferroni corrected p-value.

Table 5. Interaction effects produced by moderation analyses conducted using Model 1 of the SPSS PROCESS macro (Hayes 2013). In all cases, the independent variable was group (secular vs. spiritual induction) and n=73.

Dependent Variable (Covariate)	Moderator Variable			
	FACIT-Sp	DoS Atheism	DoS Agnosticism	DoS Scientism
CEQ T2 (CEQ T1)	$\Delta R^2 = 0.0003$, F(1,68) = 0.05, p = .82	$\Delta R^2 = 0.0013$, F(1,68) = 0.24, p = .63	$\Delta R^2 = 0.0000$, F(1,68) = 0.01, p = .94	$\Delta R^2 = 0.0046$, F(1,68) = 0.83, p = .37
SMS T3 (SMS T2)	$\Delta R^2 = 0.0006$, F(1,68) = 0.09, p = .77	$\Delta R^2 = 0.0017$, F(1,68) = 0.26, p = .61	$\Delta R^2 = 0.0060$, F(1,68) = 0.91, p = .34	$\Delta R^2 = 0.0166$, F(1,68) = 2.56, p = .11
PANAS pos T3 (PANAS pos T2)	$\Delta R^2 = 0.0002$, F(1,68) = 0.05, p = .83	$\Delta R^2 = 0.0035$, F(1,68) = 0.99, p = .32	$\Delta R^2 = 0.0021$, F(1,68) = 0.59, p = .45	$\Delta R^2 = 0.0020$, F(1,68) = 0.54, p = .47
PANAS neg T3 (PANAS neg T2)	$\Delta R^2 = 0.0018$, F(1,68) = 0.40, p = .53	$\Delta R^2 = 0.0120$, F(1,68) = 2.84, p = .10	$\Delta R^2 = 0.0019$, F(1,68) = 0.43, p = .52	$\Delta R^2 = 0.0000$, F(1,68) = 0.01, p = .94

T1=Time 1; T2=Time 2; T3=Time 3; CEQ=Credibility / Expectancy Questionnaire; SMS=State Mindfulness Scale; PANAS=Positive and Negative Affect Scale-short form; pos=positive affect; neg=negative affect; FACIT-sp=Functional Assessment of Chronic Illness Therapy -Spiritual Wellbeing; DoS=Dimensions of Secularity. Given that all the findings were non-significant, it was not necessary to apply the Bonferroni correction, as this decreases significance rather than increases it.

Figure 1. The CONSORT flow diagram for the study

