

Abstract

Objectives: Mindfulness-Based Interventions (MBIs) touch on concepts deemed spiritual or religious in the popular imagination, which may interact with participants' own religious beliefs to influence implementation-relevant outcomes.

Methods: Four studies examined how interactions between different (a)religious framings of MBIs and participants' religious and existential characteristics are related to participant responses to the MBIs. Two cross-sectional studies ($N=480$ MTurk participants and $N=266$ undergraduates) examined associations between individual differences in religious/existential characteristics (scriptural literalism and existential flexibility) and participants' willingness to try mindfulness described as (a) secular, (b) spiritual, (c) Buddhist, (d) from one's own religion, or (e) from an unspecified background. Next, two experiments ($N=677$ MTurk participants and $N=157$ undergraduates) randomized participants to brief MBIs framed as either "secular," "spiritual," or "Buddhist," and examined acceptability of the MBI post-intervention.

Results: Both cross-sectional studies revealed interactions of participant characteristics and MBI labels on willingness to try the MBI. Existential flexibility was positively associated with willingness to try mindfulness overall, and willingness to try "secular" and "Buddhist" mindfulness. Scriptural literalism was positively associated with greater willingness to try mindfulness labeled as "spiritual" or "from your own religious tradition," and negatively with "Buddhist" or "secular" mindfulness. In the experimental studies, condition moderated the association between existential flexibility and acceptability ratings of the MBI, with only a positive simple effect of existential flexibility on acceptability of the Buddhist condition observed in both studies.

Conclusions: MBI framing, as well as participants' religious and existential perspectives, may influence MBI acceptability and implementation.

Keywords: Religion; acceptability; implementation; dissemination; culture; worldview; intervention adaptation

Mindfulness-Based Interventions (MBIs) comprise an increasingly popular set of treatments, with demonstrated efficacy across a range of treatment targets (Creswell, 2017; Goldberg et al., 2021a). Mindfulness has historical ties to religious traditions of South and East Asia, although the nature, extent, and fidelity of the associations between mindfulness and religion is a matter of debate (Compson, 2017; Lindahl, 2014; McMahan, 2008). Nonetheless, these associations may impact how individuals respond to MBIs, with important implications for acceptability, implementation, and dissemination (Doren et al., 2021; Harrington & Dunne, 2015). In particular, the degree of fit between participants' own beliefs and worldviews on one hand, and the religious and existential worldviews signaled in an MBI's framing, may influence how participants respond to an MBI (Brown, 2019; Palitsky & Kaplan, 2021).

MBIs are defined here as any psychosocial intervention that includes "mindfulness" within its self-description, reflecting the broad and often non-specific usage of the term mindfulness. The question of whether (and how) interventionists should address the religious associations of mindfulness is contested. It has been influentially argued that MBIs should be presented as secular practices to alleviate concerns about religious indoctrination (Hayes & Shenk, 2004). However, this approach has also been characterized as "stealth Buddhism" (Brown, 2016) and, indeed, proponents of secularized mindfulness have occasionally acknowledged as much (Kabat-Zinn, 2011). A further concern is that due to the existence of strong historical ties, it may be unethical to elide MBIs' associations with Buddhism, as such representation is on some level deceptive to MBI recipients. It has also been argued that the religious and spiritual components of MBIs are important for their positive impact, and that MBIs without such components may be less effective (Monteiro, et al., 2014; cf. Lindahl, 2014). There is a corresponding concern, however, that religious presentation of MBIs is a form of

cultural misappropriation of traditional communal and religious praxes (Carrette & King, 2005). Others have proposed that specific religious modifications of MBIs should be available for adherents to religions such as Christianity or Islam (Hathaway & Tan, 2009; Knabb, 2010).

Despite this rich ongoing theoretical discussion, there are scant empirical data to support any specific recommendations. Research suggests that despite the popularity of mindfulness in the US, acceptability and preference for MBIs is mixed (Burke, 2012; Burke et al., 2017). Burke, et al. (2017) analyzed data from the National Health Interview Survey ($n = 34,525$), which asked participants to endorse whether they used spiritual, mantra, or mindfulness meditation, providing examples but not defining these terms for participants. They observed that more Americans use spiritual meditation than mindfulness or mantra meditation, and that certain individual difference characteristics (e.g. former alcohol drinkers) are associated with greater use of spiritual meditation (Burke et al., 2017). Another study found that spiritual content in an MBI improved aspects of response to a cold pressor task (Feuille & Pargament, 2015). The spiritual content in this study employed terms like “spiritual connection” and “the sacred,” used theistic language, and offered a perennialist interpretation of spirituality in affirming that its focus was consistent with multiple religious traditions including Christianity and Buddhism. Notably, the majority of participants in that study self-identified as Christian, and it is possible that the observed benefit was influenced by a good match between participant and intervention characteristics.

Spirituality has also been identified as an important consideration in the development of culturally relevant mindfulness interventions for minoritized communities in the US (Proulx et al., 2018), although in a recent review and meta-analysis of adaptations of mindfulness for Hispanic populations no explicitly spiritual or religious adaptations were observed (Castellanos et al., 2020). There may be preference against Buddhist elements tacitly or explicitly associated

with mindfulness among some conservative non-Buddhist religious denominations. In the US some religious communities have advocated against the incorporation of mindfulness or yoga into public spaces like schools, preferring a secular environment to one that might be construed as indoctrination into another faith system (Brown, 2019).

Further research examining how participants' religious and existential worldviews impact their responses to MBIs can help inform best practices in MBI adaptation, implementation, and dissemination. For example, should MBIs be presented as secular or in some sense religious? How should correspondence between the participant's worldview and the presentation of the MBI be handled? Basic research investigating participant responses to brief, targeted manipulations in MBI presentation can lay important groundwork for further intervention development. Accordingly, the overarching goal of this research is to take a preliminary step in addressing the question: do religious and existential worldviews – on the part of the MBI as well as its recipients – influence participants' responses to an MBI? This article presents four studies that investigate how participants with varying religious and existential perspectives respond to different (non-)religious framings of MBIs. *Religious framing* refers to the signaling of associations with specific religions, religion as general concept, or concerns deemed spiritual, through the way an MBI is presented to participants. Thus, framing pertains to the *representation* of an MBI to participants, rather than to any essential attributes or qualities of the MBI itself. The present studies used changes in language to provide different framings for MBIs.

The four studies presented in this paper investigated two dimensional indices of religious and existential worldviews applicable across religious affiliations—Scriptural Literalism and Existential Quest—as predictors of responses to MBIs with different religious framings. Scriptural Literalism, indexed by the Truth of Texts and Teachings (TTT) subscale of the

Religious Schemas Scale (Streib et al., 2010), entails beliefs that scriptural texts from one's faith tradition, interpreted literally, are the primary source of religious truth. Existential Quest (EQ), indexed by the Existential Quest Scale (Van Pachterbeke et al., 2012), entails flexibility in existential worldviews. The studies investigated interactions between religious framings and these dimensional indices of religious and existential worldviews on the primary outcomes of willingness to try mindfulness (Study 1a & 1b) and acceptability of mindfulness by participants (Study 2a and 2b).

It was hypothesized that EQ would positively predict overall willingness to try MBIs in Studies 1a and 1b (H1), as well as greater acceptability of MBIs in Studies 2a and 2b (H2). It was further hypothesized that EQ would be associated with preference for secular and Buddhist framings of mindfulness in Studies 1a and 1b (H3), as well as greater acceptability of secular and Buddhist MBI framings in Studies 2a and 2b (H4). It was also hypothesized that in Studies 1a and 1b individuals high in TTT would be the least willing to try mindfulness types that diverge from norms consistent with Abrahamic traditions, including secular and Buddhist mindfulness (H5), and that individuals higher in TTT would provide the lowest acceptability ratings for secular and Buddhist framings of mindfulness in Studies 2a and 2b (H6). Exploratory analyses were also planned to investigate whether the different conditions in Studies 2a and 2b elicited different impromptu responses to their religious and spiritual content, via free responses to the mindfulness guidance.

Studies 1a and 1b

Studies 1a and 1b examined whether participants' own religious and existential perspectives impact their willingness to try MBIs labeled with different religious framings to cope with stress in their lives.

Methods

Participants

Study 1a Participants. 533 Amazon Mechanical Turk workers were recruited for participation in an online survey administered via Qualtrics. The study was presented with the title “Attitudes about Mindfulness.” During the informed consent process, participants were told that “In this online survey, you will be asked to complete several questionnaires asking you about your personality, your attitudes toward the world, and your held beliefs.” They were compensated \$1.01 for their participation. Fifty-three participants were excluded from analyses due to failed attention checks (e.g. “If you are reading this question, please select ‘somewhat disagree.’”) or incomplete surveys, resulting in a final sample of 480 individuals (235 female; Age: $M = 34.6$, $SD = 10.3$).

Study 1b Participants. Study 1b was conducted as a replication of Study 1a in a college student population, given that Amazon Mechanical Turk participants have demonstrated differences from other populations, including greater overall tendencies toward secularism (Goodman et al., 2013). The study was described to participants in the same way as Study 1a. Three hundred and thirty-eight undergraduate college students were recruited from a large university in the Southwestern US. Due to failed attention checks or incomplete surveys, 72 participants were excluded from the study, resulting in a final sample size of 266 individuals (205 female; Age: $M = 19.2$, $SD = 3.63$). Participants were compensated with course credit for an Introduction to Psychology course.

Procedures

Study 1a Procedures. Interested individuals on MTurk followed a Qualtrics link to participate in the study. After providing electronic informed consent for participation in the

study, participants completed the following questionnaires in the following order: the Ten Item Personality Inventory (TIPI), items assessing participants' prior experiences with mindfulness, Mindfulness Willingness Questions, Existential Quest (EQ), Religious Schema Scale: Truth of Texts and Teachings (TTT) subscale, and a demographics questionnaire that also included a question about participants' beliefs about whether or not mindfulness has a religious component (median time to complete = 7.82 minutes). Because of concerns that the predominance of questions about religion in this study might influence participants to think that this study was specifically about their religious perspectives' influence on their interest in mindfulness and therefore influence their responses, questions querying religious attitudes were placed *after* the questions about willingness to try mindfulness.

Study 1b Procedures. Participants were directed to a Qualtrics link to provide online consent and participate in the questionnaire study, which followed the same order and format as in Study 1a (median time to complete = 15.12 minutes). Participants were compensated with course credit for an Introduction to Psychology course.

Measures

Mindfulness Willingness Questions. Participants were asked 5 questions (randomly counterbalanced) about how willing they would be to use differently labeled types of mindfulness to cope with stress in their life. Questions took the form: "Which of the following best describes how you feel about using _____ to cope with stress in your life?" with (a) "mindfulness," (b) "secular (non-religious) mindfulness," (c) "a spiritual mindfulness method," (d) "Buddhist mindfulness," and I "a mindfulness method from your own faith tradition," as five separate items with responses on a 5-point Likert scale (scoring: 1 = very uncomfortable with the idea; 5 = very comfortable with the idea).

Existential Quest (EQ). The EQ Scale was used to evaluate the flexibility of participants' religious outlooks (Van Pachterbeke et al., 2012). This scale consists of 9 Likert items asking participants to rate their agreement with a series of statements (1 = strongly disagree, 7 = strongly agree). Two sample items are: "My way of seeing the world is certainly going to change again," and "I know perfectly well what the goal of my life" (R). This scale demonstrated acceptable reliability across both studies, $\alpha_{\text{Study1a}} = 0.75$, $\alpha_{\text{Study1b}} = 0.74$.

Religious Schema Scale: Truth of Texts and Teachings (TTT). The Religious Schema Scale's TTT subscale was used to assess scriptural literalism (Streib et al., 2010), consisting of five Likert items (1 = strongly disagree, 7 = strongly agree). A sample item is: "What the texts and stories of my religion tell me is absolutely true and must not be changed." This scale demonstrated high reliability across both studies, $\alpha_{\text{Study1a}} = 0.95$, $\alpha_{\text{Study1b}} = 0.92$.

Openness Subscale of the Ten Item Personality Inventory (TIPI). The TIPI is a 10-item measure of the Big Five personality dimensions using Likert-type items (1 = Disagree strongly, 7 = agree strongly) that has demonstrated adequate convergence with longer measures of Big Five personality traits (Gosling et al., 2003). The Openness subscale consists of two items, which are averaged to produce the subscale score; calculation of alphas is not recommended for this two-item scale by its authors. A sample item is "I see myself as someone who has an active imagination."

Participant Characteristics and Demographics. Participants were asked their age (in years), gender (male, female, transgender, other), ethnicity (Asian American, African American, Latino/Hispanic, Native American, White (non-Hispanic), Other), Socioeconomic Status, and religious affiliation (15 affiliative categories). See Supplementary Document I for specific categories and response options. After religious affiliations were endorsed by participants, these

responses were re-coded into a derived set of four descriptive religion characteristics including Non-Affiliated = 0, Catholic = 1, Protestant = 2, or Other = 3 affiliations. Those who endorsed “atheist” or “agnostic” were regarded as non-affiliated.

Political Orientation. Participants were asked about their political orientation with two Likert-style items (1 = very conservative, 9 = very liberal). The first item queried social political orientation: “When it comes to *social issues*, how would you describe your political beliefs?” The second item queried economic political orientation: “When it comes to *economic issues*, how would you describe your political beliefs?”

Belief that Mindfulness Has a Religious Component. Participants were asked about the extent to which they believed that mindfulness has a religious component (BMR) using a single-item Likert measure “In your opinion, is there a religious component to mindfulness?” (0 = definitely no; 5 = definitely yes).

Prior Experience with Mindfulness. Participants were asked whether they had previously tried any form of mindfulness before (dichotomous response: yes or no).

Data Analyses

To characterize the samples, after obtaining descriptive statistics of EQ, TTT, and religious affiliation, distribution statistics were examined for EQ and TTT using the Shapiro-Wilk tests of normality. The proportion of the four derived religious affiliation categories in each study was compared using a Chi square test.

Because the hypotheses posited that (H1) willingness to try mindfulness would be influenced by EQ, (H3) by the interaction of mindfulness type and EQ, as well as (H5) the interaction of mindfulness type and TTT, they were tested through statistical interactions. To

examine and plot interactions between predictors and mindfulness type, a multilevel model was tested with willingness responses (level I) nested within individual participants (level II).

The effects of intercept were allowed to vary randomly and mindfulness type was represented as a fixed effect; see Supplementary Document I, section IV for multilevel model equations. Statistical software R package nlme (Pinheiro, et al. 2020) was used to test the models and generate predicted means for plotting. Given the novelty of this research, covariates were selected empirically (Sauer et al., 2013). To achieve the most parsimonious well-fitting model, for each predictor (respectively EQ and TTT), the following models were tested sequentially (model specifications and full model outputs are presented in Supplementary Document I, Sections IV-V).

First, models were tested with primary predictors and all covariates, with religious affiliation as a polytomous factor (Model 0). Then, unadjusted interactions were tested with only the predictor (TTT or EQ), mindfulness type (as a polytomous factor), and their interaction (Model 1). Finally, an adjusted model was tested with the predictor (TTT or EQ), mindfulness type, and their interaction, as well as variables with observed significant effects in Model 0 as covariates (Model 2). AIC and BIC indices were used to examine differences in model fit and plots were rendered based on the most parsimonious, best-fitting models. Interactions between predictor of interest (TTT and EQ) and mindfulness types, as well as simple slopes, were obtained by reparametrizing the same model iteratively with each mindfulness type alternately included as the reference category. Non-standardized B and standardized β regression coefficients are reported, with standardized coefficients obtained by initially standardizing all appropriate variables prior to inclusion in models. Mean-centered values of all covariate predictors were used in plotting interactions. Finally, in order to estimate the linear associations

between EQ or TTT with overall willingness to try mindfulness, models were specified that treated willingness as a dependent variable without grouping by mindfulness type.

Models with EQ as a predictor were used to test H1 by examining the association of EQ with willingness to try mindfulness overall, as well as H3 by first testing the interaction of EQ by mindfulness type, and subsequently analyzing simple slopes of EQ and (1) willingness to try Buddhist, and (2) secular mindfulness, specifically. Models with TTT as a predictor were used to test H5 by first testing the interaction of TTT by mindfulness type, and subsequently analyzing simple slopes of TTT and (1) secular mindfulness, (2) Buddhist mindfulness, (3) spiritual mindfulness, and (4) mindfulness from one's own tradition specifically.

Results

Preliminary Analyses

Participant demographic characteristics are reported in Supplementary Document I. Shapiro-Wilk tests of normality found EQ to be non-normally distributed ($p = 0.006$) in Study 1a but did not find evidence of non-normality in Study 1b ($p = 0.427$). EQ was negatively skewed in Study 1a (-0.17). Shapiro-Wilk tests of normality indicated non-normality for TTT in both Study 1a ($p < 0.001$) and Study 1b ($p < 0.001$). TTT was positively skewed in Study 1a (0.63) and in study 1b (0.09). The proportion of affiliations differed between Study 1a and 1b, $\chi^2(3, N = 746) = 25.16, p < 0.001$, with a greater percentage of unaffiliated participants in Study 1a (45.4%) than Study 1b (29.3%), $\chi^2(3, N = 746) = 18.52, p < 0.001$, but far fewer Catholics in Study 1a (12.5% vs. 23.7%) $\chi^2(3, N = 746) = 15.55, p < 0.001$.

Belief that There Is a Religious Component to Mindfulness (BMR). In Study 1a, 28 (5.8%) indicated definitely yes, 92 (19.2%) indicated probably yes, 154 (32.1%) indicated maybe, 127 (26.5%) indicated probably not, and 79 (16.5%) indicated definitely not. In Study

1b, 38 (14.2%) indicated definitely yes, 75 (28.1%) indicated probably yes, 112 (41.96%) indicated maybe, 25 (9.4%) indicated probably not, and 17 (6.4%) indicated definitely not.

Multilevel Models

In all cases, and in both Studies 1a and 1b, Model 2 was selected due to superiority to Models 0 and 1 either in fit or parsimony, although the patterns of results for EQ and TTT predicting willingness to try different types of mindfulness remained consistent across all models. Correspondingly, simple slopes and plots were obtained from Model 2 statistics (Figures 1-2). Results for all models are reported in Supplementary Document I, Section V. In addition, tables representing only the Model 2 analyses reported here are represented separately for convenience in Supplementary Document II.

Study 1a. Non-significant covariates and predictors in Model 0 ($p > 0.05$) included gender, age, SES, ethnicity, social and economic political orientation, and were pruned from the fully adjusted model. The following variables emerged as significant covariates and were retained for fully adjusted analyses with TTT and EQ as predictors in Model 2: prior experience with mindfulness, TIPI Openness, BMR, and Affiliation.

EQ as Predictor. In the adjusted model (Model 2: AIC = 7033.25, BIC = 7137.35), main effects were revealed for EQ ($F[1,472] = 29.07, p < 0.001$) (testing H1), MBI type ($F[4,1912] = 122.33, p < .001$), and their interaction ($F[4,1912] = 5.65, p = <.001$) (recall that H3 was tested as a statistical interaction). Simple slope analyses only revealed positive effects of EQ on willingness to try secular mindfulness ($B = 0.17, \beta = 0.12, SE = 0.05, t(475) = 3.00, p = 0.003$), Buddhist mindfulness ($B = .30, \beta = 0.30, SE = 0.06, t(475) = 5.29, p < 0.001$), and spiritual mindfulness, ($B = 0.18, \beta = 0.13, SE = 0.06, t(475) = 3.10, p = 0.002$), but did not find associations within other mindfulness framings.

TTT as Predictor. In the adjusted model (AIC = 6603.37, BIC = 6707.43), main effects were revealed for TTT ($F[1,471] = 19.63, p < 0.001$), MBI type ($F[4,1908] = 152.76, p < 0.001$), and their interaction ($F[4,1908] = 126.71, p < 0.001$) (recall that H5 was tested as a statistical interaction). Simple slope analyses revealed negative effects of TTT on willingness to try secular ($B = -0.19, \beta = -0.28, SE = 0.03, t(471) = -5.74, p < 0.001$) and Buddhist mindfulness ($B = -0.13, \beta = -0.19, SE = 0.03, t(471) = -3.83, p < 0.001$), and positive effects of TTT on willingness to try mindfulness framed as spiritual ($B = 0.31, \beta = 0.46, SE = 0.03, t(471) = 9.51, p < 0.001$) and from your own tradition ($B = 0.30, \beta = 0.44, SE = 0.03, t(471) = 9.11, p < 0.001$).

Study 1b. Non-significant covariates from Model 0 ($p > 0.05$) included gender, age, SES, ethnicity, social and economic political orientation, and BMR, and were pruned from the fully adjusted model. The following variables emerged as significant covariates and were retained for fully adjusted analyses with TTT and EQ as predictors in Model 2: prior experience with mindfulness, TIPI Openness, and Affiliation.

EQ as Predictor. In the adjusted model (AIC = 3697.01, BIC = 3858.00), main effects were revealed for EQ ($F[1,259] = 5.10, p = 0.025$), MBI type ($F[4,1056] = 63.37, p < 0.001$), and their interaction ($F[4,1056] = 3.29, p = 0.011$). Simple slope analyses only revealed positive effects of EQ on willingness to try secular mindfulness ($B = 0.22, \beta = 0.16, SE = 0.08, t(259) = 2.91, p = 0.004$) and Buddhist mindfulness ($B = 0.33, \beta = 0.24, SE = 0.08, t(259) = 4.28, p < 0.001$).

TTT as Predictor. In the adjusted model (AIC = 3510.28, BIC = 3671.15), main effects were revealed for TTT ($F[1,258] = 26.82, p < 0.001$), MBI type ($F[4,1052] = 64.82, p < 0.001$), and their interaction ($F[4,1052] = 63.29, p < 0.001$). Simple slope analyses revealed negative effects of TTT on willingness to try “secular” ($B = -0.19, \beta = -0.28, SE = 0.04, t(261) = -4.62, p <$

0.001) and Buddhist mindfulness ($B = -0.18, \beta = -0.27 SE = 0.04, t(258) = -4.02, p < 0.001$), and positive effects of TTT on willingness to try mindfulness that is spiritual ($B = 0.24, \beta = 0.36 SE = .04, t(258) = 5.71, p < 0.001$) and from your own tradition ($B = 0.39, \beta = 0.57 SE = 0.04, t(258) = 10.49, p < 0.001$).

Discussion

It was observed that EQ was associated with greater willingness to try MBIs in general, supporting H1. EQ was also associated with preference for secular and Buddhist mindfulness in Studies 1a and 1b (consistent with H3), as well as spiritual mindfulness in Study 1a. Meanwhile, higher TTT was associated with willingness to try MBIs that are spiritual or that cohere with one's own religious tradition, but less willingness to try secular or Buddhist MBIs—possibly because of a perceived discrepancy between one's own religious outlook and the MBI—supporting H5. Religious affiliation also emerged as a significant covariate, with unaffiliated participants being the least willing and individuals in the “other” affiliation category being the most willing to try different kinds of mindfulness. This suggests that categorical religious affiliation, in addition to overall scriptural literalism and flexibility of existential beliefs, impacts perceptions of MBIs.

Studies 2a and 2b

Study 1 findings suggest that differences in the way that mindfulness is labeled, vis-a-vis its religious associations, may influence attitudes toward and prima facie willingness to try mindfulness interventions. To test whether individual differences in religious and existential perspectives influence people's responses to MBIs with different religious framings, Study 2 employed an experimental design to evaluate the acceptability of three brief guided mindfulness practices, each with minimal language changes to reflect different religious framings: secular,

Buddhist, and spiritual. These three framings were selected because of divergent prima facie responses to secular, spiritual, and Buddhist mindfulness in Studies 1a and 1b. Because it was unknown what the religious background of participants enrolled into each condition would be ahead of time, it was not possible to create a framing from a participant's own tradition. As with Studies 1a and 1b, the same protocol was conducted in two different populations: first on Amazon Mechanical Turk ($N = 763$; Study 2a), and second in a replication study at a university in the Southwestern United States ($N = 157$; Study 2b). In addition to the analyses presented below, affective responses to the three conditions were analyzed and have been presented separately (Anderson, et al., in press).

Methods

Participants

Study 2a Participants. 763 Amazon Mechanical Turk workers were recruited for participation in this research. Participants were compensated \$1.50 for receiving a brief mindfulness intervention and subsequently completing a survey online via Qualtrics. Mean time to complete the study was 844 seconds ($SD = 396.30$). Data for 80 participants were excluded due to failed attention checks or failure to complete the full study, yielding 683 in the final analyses (351 female; Age: $M = 37.12$, $SD = 12.01$).

Study 2b Participants. 157 undergraduate college students from a city in the Southwestern US (100 female; Age: $M = 18.80$, $SD = 1.36$) were recruited. Participants were compensated with course credit for an Introduction to Psychology course.

Procedures.

All participants completed the experiment online using Qualtrics survey software. The study was presented as the "MBI Experiences Study." As MBIs are often introduced in care

settings when participants are interested in addressing a problem (e.g., depression) rather than seeking out mindfulness per se, further descriptions were not provided in order to reduce self-selection from participants who might prefer to be in a mindfulness study. Study 2a participants completed the study from home or a location of their choice, and were required to be able to play audio in order to participate in the study, which was confirmed by an audio capability test. Study 2b participants completed the experiment in a laboratory setting using a private computer at a console equipped with headphones.

After providing informed consent, participants were randomized to one of three MBI framing conditions. Each condition presented participants with guided mindfulness administered via audio recording (for randomization and demographic information see Table 1). After hearing the mindfulness recording, participants rated the acceptability of the intervention. They were subsequently asked to what extent they believe that mindfulness has a religious component, followed by questionnaires including EQ and TTT. Last, they completed demographic and individual-difference items used in Studies 1a and 1b, and finally completed a brief open-ended feedback response to the study.

MBI Intervention. Secular, Buddhist, and spiritual conditions each had distinct guided mindfulness instructions. These instructions were based on a modified version of the UCLA *MARC* mindfulness script (UCLA Mindful Awareness Research Center, 2011). Although mostly left identical, some of the language in each script was minimally modified in the same parts of the text for all conditions in order to frame the intervention content as either secular, Buddhist, or spiritual (Table 1). The script for the secular condition was informed by attempts to secularize guided mindfulness by emphasizing a scientific basis for the techniques. The spiritual condition script was informed by a prior study comparing spiritual and secular mindfulness (Feuille &

Pargament, 2015), which employed a spiritual mindfulness condition that adopted language based on a perennial, rather than tradition-specific, approach to spirituality. The Buddhist condition was informed by terminology and presentation of mindfulness as Buddhist, but in lay contexts. In creating the three conditions, each of the scripts were evaluated by a panel of six experts: two mindfulness meditation instructors, one member of Methodist clergy, one member of Unitarian Universalist clergy, one member of African Methodist Episcopal clergy, and an expert in religious studies (see Supplementary Document I, Section IX for details, including full scripts). These individuals were asked to provide feedback about the face validity and appropriateness of the scripts, and modifications were made based on their feedback. Duration of all guided mindfulness instructions was between 6:00 minutes and 6:22 minutes, and recordings were created by an individual certified in facilitating a widely disseminated MBI.

Measures

Participants were administered questionnaires identical to those used in Studies 1a and 1b, including demographic items, EQ ($\alpha_{\text{Study2a}} = 0.75$, $\alpha_{\text{Study2b}} = 0.66$), and TTT ($\alpha_{\text{Study1b}} = 0.94$, $\alpha_{\text{Study2b}} = 0.90$).

Intervention Acceptability. After the brief MBI, participants were asked to rate the acceptability of the intervention they experienced. These ratings were provided via three visual analog scales (0 = not at all, 100 = very much) associated with the following questions: (1) “Did you like the mindfulness guidance?” (2) “Would you want to do this practice again in the future?” and (3) “Would you recommend this mindfulness practice to a friend?” Exploratory factor analysis revealed that these items loaded onto a single factor, which also demonstrated high reliability ($\alpha_{\text{Study1b}} = .96$, $\alpha_{\text{Study2b}} = .94$), and item scores were averaged to produce a single acceptability score for subsequent analyses.

Belief that Mindfulness Has a Religious Component. This item was the same as the item used in Studies 1a and 1b. It was presented directly after acceptability items in Study 2a. In Study 2b, this question was moved to the end of the survey to reduce direct influence of condition on responses to this item.

Open-ended Feedback. As the final item of the study, participants were presented with the following open-ended prompt: “Please tell us a little bit about what your experience with the mindfulness instructions was like.” Responses were coded dichotomously for low acceptability according to two categories: The first category pertained to explicit statements of dislike about religious or spiritual content in the instructions (absence = 0, presence = 1). The following two examples both received a code for the presence of dislike about religious/spiritual content: “...*On top of that there was the f[sic]ing new age crap. I loathe that sit... (sic)*” and “*I was annoyed by the religious component to this exercise, but otherwise (when I ignored the spiritual stuff) I was able to focus and relax.*” The second category pertained to explicit statements of dissatisfaction associated with the instructions and unrelated to religious or spiritual content (absence = 0, presence = 1). Sample responses that received this code are: “*It was very droning as to tone. I generally do not participate in these type of meditations or functions. I find them slightly slow.*” and “*Uncomfortable. Not my usual reaction to this sort of ta’e, and I’m not really sure why I found this one so irritating. Maybe subconsciously her voice reminded me of someone that annoys me.*” Coding categories were used independently (responses could be assigned one, both, or neither code). Coding was undertaken by an undergraduate research assistant blinded to other study measures and to condition. 10 responses were deemed ambiguous by the coder; these were resolved with assistance from the lead author, who was also blind to condition at the time.

Data Analyses

After obtaining descriptive statistics of EQ, TTT, and religious affiliation, distribution statistics were examined for EQ and TTT using the Shapiro-Wilk tests of normality. To characterize samples, the proportion of the four derived religious affiliation categories in each study was compared using a Chi square test. To test randomization, mean differences between conditions in EQ, TTT, BMR, and acceptability were tested via one-way ANOVAs.

In order to test the hypotheses that acceptability would be associated with: EQ (H2), the interaction of condition and EQ (H4), and the interaction of condition and TTT (H6), separate moderation analyses were performed using the SPSS Macro *Process* (Hayes, 2013), regressing acceptability ratings onto EQ, condition, and their interaction in one analysis, and regressing acceptability ratings onto TTT, condition, and their interaction in a separate analysis.

Bootstrapping (5000 iterations) was performed due to non-normality of variables. In order to conduct analyses with a multicategorical focal moderator (Hayes & Montoya, 2017), simple indicator coding was used automatically by *Process*, effectively comparing each non-reference category against the reference category. The model thus included the relevant predictor (TTT or EQ), dummy-coded condition variables, and the interaction terms for the dummy-coded condition variables and the predictor. To obtain all interaction coefficients, models were re-specified with alternate reference categories.

The frequencies of coded responses to the open-ended feedback item were compared across conditions in additional exploratory analyses. A 3 (condition: Buddhist, Secular, Spiritual) x 2 (problems: absent, present) chi-square test for non-independence was computed for the presence vs. absence of problems with spiritual or religious content, and for problems with the instructions in general, in two separate tests. Significant Chi-square would indicate that the different rates of negative responses were dependent on condition.

Results

Preliminary Analyses

Shapiro-Wilk tests of normality on EQ and TTT found EQ to be non-normally distributed ($p < 0.001$) with negative skew (-0.56) in Study 2a, but did not find evidence of non-normality in EQ in Study 2b ($p = 0.655$). There was evidence of non-normality for TTT in both Study 2a and 2b ($p < 0.001$) with positive skew (0.19 and 0.20, respectively). The proportion of religious affiliations differed between studies, $\chi^2(3, N = 839) = 21.56, p < 0.001$, with a greater percentage of unaffiliated individuals in Study 2a (39.6%) than in Study 2b (29.9%), $\chi^2(3, N = 839) = 5.06, p = 0.025$, and fewer Catholics in 2a (14.5% vs. 29.9%) $\chi^2(3, N = 839) = 21.11, p < 0.001$. This overall pattern was similar to the characteristics of Studies 1a and 1b. In Study 2b Levene's test revealed heteroscedasticity across conditions for BMR (3.51, $p = 0.032$) and MBI acceptability (3.34, $p = 0.038$). For this reason, Welch and Brown-Forsythe one-way ANOVAs were used to test for differences in means across conditions, with Fisher's LSD for pairwise comparisons.

Belief that There Is a Religious Component to Mindfulness (BMR). In Study 2a, 163 (23.9%) indicated definitely yes, 153 (22.4%) indicated probably yes, 183 (26.8%) indicated maybe, 118 (17.3%) indicated probably not, and 65 (9.5%) indicated definitely not. In Study 2b, 10 (6.4%) indicated definitely yes, 48 (30.6%) indicated probably yes, 68 (43.3%) indicated maybe, 17 (10.8%) indicated probably not, and 14 (8.9%) indicated definitely not.

Comparisons of Study Conditions

Differences in religious affiliation groups were not observed between conditions, $\chi^2(6, N = 682) = 5.75, p = 0.451$. Exploratory analyses examining differences in acceptability based on affiliation are reported in Supplementary Document I, Section VII. Comparisons of EQ, TTT,

and BMR between study conditions in one-way ANOVAs only revealed significant differences in BMR between conditions, $F(679) = 19.98, p < 0.001$, Fisher's LSD post-hoc test revealed that BMR was higher in the spiritual MBI group than in the Buddhist and secular conditions, with mean differences of 0.51 and 0.70 respectively ($ps < 0.001$). This suggests that those in the spiritual condition had greatest perception of mindfulness as having a spiritual component, followed by the Buddhist condition, and then the secular condition, which is consistent with BMR's position after the experimental manipulation across conditions, possibly influencing belief about religious components to mindfulness.

In Study 2b, differences in religious affiliation groups were not observed across conditions, $\chi^2(6, N = 157) = .36, p = 0.618$, and no significant differences across study conditions were revealed for BMR, MBI acceptability, any of the pre-post affect measures, TTT, or EQ. This suggests that moving the BMR question to the end of the survey in an attempt to reduce direct influence of condition, and to provide a more general measure of the extent to which participants believed mindfulness to have a religious component, was successful.

Homoscedasticity assumptions for regression analyses were not violated.

Existential Quest

Full results of regression models for EQ are reported in Supplementary Document III.

Study 2a. Regression analyses revealed an independent main effect of EQ on acceptability in Study 2a, $B = 6.13, \beta = 0.18, SE = 1.12, p < 0.001$ (testing H2). This suggests that overall, participants who scored higher in EQ were more likely to endorse the MBI they experienced regardless of condition. To examine the conditional effects of EQ on acceptability, moderation analysis was conducted regressing acceptability onto EQ, condition, and their interaction with bootstrapping (5000 iterations). No effect of condition emerged, and a

significant interaction of EQ by condition emerged only for spiritual vs. secular conditions ($B = -5.78$, $\beta = -0.11$, $SE = 2.75$, $p = 0.036$) (recall that H4 was tested as an interaction). Simple slope analyses revealed a significant positive association between EQ and acceptability in the spiritual condition, $B = 8.63$, $\beta = 0.29$, $SE = 1.92$, $p < 0.001$, a weaker association in the Buddhist condition, $B = 5.10$, $\beta = 0.17$, $SE = 2.03$, $p = 0.012$, and no association in the “secular” condition, $B = 2.85$, $\beta = 0.09$, $SE = 1.98$, $p = 0.150$ (Figure 4).

Study 2b. In regression analysis the main effects of EQ on acceptability observed in Study 2a did not replicate in Study 2b, $B = 1.53$, $\beta = 0.04$, $p = 0.604$. Moderation analysis was conducted as in Study 2a. No main effects of condition were observed. A significant interaction was revealed only for the Buddhist vs. Spiritual conditions, $B = 14.66$, $\beta = 0.23$, $SE = 7.23$, $p = 0.044$. In post hoc simple slope analyses EQ predicted acceptability in the Buddhist condition ($B = 11.80$, $\beta = 0.32$, $SE = 5.16$, $p = 0.024$), but not in the secular ($p = 0.824$) or spiritual ($p = 0.573$) conditions (Figure 4).

Truth of Texts and Teachings

Full results of regression models for TTT are reported in Supplementary Document III.

Study 2a. Regression analyses revealed a significant independent effect of TTT on acceptability, $B = 1.97$, $\beta = 0.13$, $SE = 0.57$, $t(681) = 3.47$, $p = 0.001$. No significant TTT by condition interactions were observed (recall that H6 was tested as an interaction).

Study 2b. Regression analyses did not reveal any main effect of TTT on acceptability, $B = -0.551$, $\beta = -0.32$, $SE = 1.37$, $t(155) = -0.40$, $p = 0.690$. Subsequent moderation analyses did not reveal any significant interaction effect of TTT by condition on acceptability.

Open-ended Feedback

Study 2a. A chi-square test revealed non-independence on condition of presence vs. absence of dislike for religious content, $\chi^2 (2) = 36.63, p < 0.001$. The most participants left negative comments about religion or spirituality in the spiritual condition (24, 9.6%), followed by the Buddhist (2, 0.9%) and secular (0) conditions. More general negative comments about the experiment were also not independent of condition ($\chi^2 (2) = 10.89, p = 0.004$): the most participants left negative comments in the Buddhist (50, 22.4%), followed by the spiritual (50, 20.1%), and secular condition (23, 10.9%).

Study 2b. Negative feedback about religious/spiritual attributes was not independent of condition, $\chi^2 (2) = 9.32, p = 0.009$: more participants left negative comments about religion or spirituality in the spiritual condition (5, 11.1%), compared with the secular condition (1, 1.6%) and Buddhist condition (0, 0%). For more general negative comments about the experiment, dependence on condition was not observed, however, $\chi^2 (2) = 4.01, p = 0.135$. The highest incidence of dislike occurred in the Buddhist (12, 23.5%), followed by the spiritual (9, 20%) and secular (6, 9.8%) conditions.

Discussion

Results from Studies 2a and 2b indicate that participants' worldviews are associated with acceptability of differently framed MBIs. EQ was associated with acceptability in Study 2a but not 2b, providing only partial support for H2. Condition only moderated the associations between acceptability and EQ, but not TTT, such that the null hypothesis could not be rejected for H6. The association of EQ and acceptability in the Buddhist condition replicated across both studies, although neither study observed an effect of EQ in the Secular condition, providing only partial support for H4. The observed effect of EQ in the Spiritual condition within Study 2a was not replicated in Study 2b.

It is worth noting that Study 2a, which recruited MTurk workers, had a higher proportion of unaffiliated participants than Study 2b (39.6% vs. 29.9%). In Study 2a, the strongest relationship between EQ and acceptability emerged in the spiritual condition. In Study 2b, EQ only predicted acceptability in the Buddhist condition. One possible explanation is that in both cases, EQ may have led participants to be more accepting of a framing that was inconsistent with their own views. It is possible the spiritual condition was most discordant with Study 2a's sample, which had more unaffiliated participants. On the other hand, the Buddhist condition may have been most dissimilar from Study 2b's participants' worldviews, which were less secular, with Christianity being the predominant religious affiliation.

In open-ended responses, participants were not specifically queried about their perceptions of the religious or spiritual content of the mindfulness guidance they received. It is notable, then, that when prompted to share about their overall experience with the intervention, many participants directly spoke to concerns about religious content. This occurred predominantly in the spiritual condition, with approximately one tenth of participants in both studies (2a and 2b) reporting an aversive response to the spiritual language content. Furthermore, in Study 2a both the spiritual and Buddhist conditions were generally more disliked by respondents. Thus, mindfulness framed as secular appears to have been least likely to provoke spontaneous critique of religious content. Nevertheless, although religious or spiritual content specifically provoked negative qualitative responses from less religious individuals, quantitative data from Studies 1a and 1b suggest that a religious framing may nevertheless be preferable, though to varied extents, for others, especially when it comes to initial willingness to try an intervention (see also Anderson, et al., in press).

General Discussion

Secular framings have been proposed as most amenable for the most participants (Hayes & Shenk, 2004). However, results from this research provide only limited support for this argument. Studies 1a and 1b did not find unanimous superiority among secular presentations of MBIs, and instead found attitudes toward these to be dependent on participant religious and existential perspectives. EQ consistently positively predicted willingness to try mindfulness if it was presented without qualification, as secular, or as Buddhist. Meanwhile TTT consistently positively predicted willingness to try mindfulness if it was framed as spiritual, or as being from one's own religious tradition. However, this variable also consistently *negatively* predicted willingness to try mindfulness presented as secular or Buddhist. These findings indicate that, even before engaging in an MBI, different religious framings of MBIs have a substantial influence on the *prima facie* acceptability of these interventions for participants.

However, when participants were randomized to brief MBIs with different framings, this pattern was less consistent. EQ continued to predict greater acceptability of MBI conditions overall in Study 2a (with significant simple slopes in the Spiritual and Buddhist conditions), and within the Buddhist condition in Study 2b. As no relationship between acceptability and EQ emerged for the secular condition in either study, it is possible that greater existential flexibility was particularly relevant for lowering barriers to accepting mindfulness framed as either Buddhist or Spiritual. TTT was not associated with acceptability in either Study 2a or 2b, in contrast to the consistent relationships with willingness to try mindfulness in Studies 1a and 1b.

Overall, this array of findings suggests two things: First, for initial willingness to try mindfulness, no single framing out-performed all others, signaling the importance of correspondence between MBI framings and participants' characteristics. Second, the patterns observed for willingness to try MBIs did not carry over to acceptability of MBIs. Although it

cannot be said that the framings in Studies 2a and 2b did not matter—note the participants who specifically expressed negative responses to the religious content in the Spiritual framing conditions—their acceptability was not as dependent on religious views, especially as indexed by TTT. There are various reasons why this might be the case. Brown (2016) has observed that participants often find religious meanings even in ostensibly secular practices, and that it is possible to interpret many mindfulness practices in light of one’s own religious commitments. Mascaro et al. (2022b) similarly found that when Christian chaplains were asked to engage in contemplative practices originating in Buddhism, despite initial preferences against these practices they ultimately reframed them as either “self-care” (and thus neutral to their religious commitments) or re-interpreted them through the lens of their Christian practices. Another study found that clinical research coordinators at a cancer center who were provided a compassion-based intervention that included meditation were initially hesitant about spiritual components, but demonstrated high acceptability after they began to use the intervention (Mascaro et al., 2021). It will be important to examine whether future trials will also find that TTT predicts willingness to initially try an MBI, but not acceptability once it is tried, as well as factors that might account for such shifts in attitudes. These findings also suggest that responses of religious individuals might be under-represented in standard clinical research due to low willingness to try the intervention. In the few trials that report why potential participants in an MBI decline to enroll, religion is sometimes cited as a reason (e.g., Burnett-Zeigler, et al. 2016; Burnett-Zeigler, et al. 2019; Dutton, et al. 2013); however, it is not clear how many individuals never make it far along in a trial to have even such instances of hesitation recorded.

Thus, response to MBIs may be subject to different factors at different times. This is largely in step with implementation science models (Proctor et al., 2011), which suggest that

maximizing recruitment is distinct from maximizing efficacy, which is again distinct from maximizing effectiveness. The difference between responses in Studies 1a and 1b vs. 2a and 2b also suggest greater scrutiny of attempts to make mindfulness acceptable through changes in its presentation. If participants are initially unwilling to try mindfulness due to perceived associations with Buddhism, to what degree is it appropriate to curry acceptance by providing a Christian or secular framing? Palitsky and Kaplan (2021) described such attempts as “religious pre-positioning,” insofar as the religious associations of MBIs are ostensibly resolved by the interventionist (rather than participant) prior to the recipient’s encounter with the practice. Instead, transparency and disclosure about religious associations of an MBI may better support participant autonomy and respect for their values. Given such transparency, participants might elect to retain aspects of the MBI that are commensurable with their religious commitments.

When participants’ views about whether mindfulness has a religious component are pooled across all four of the present studies ($N = 1587$), more are inclined to agree than disagree, suggesting that religion is likely to be salient for a plurality of participants considering MBIs. This is in contrast to recent findings by Doren et al. (2021), which found that most participants did not believe mindfulness to be religious (but did believe it to be spiritual). In Studies 2a and 2b participant responses may also have been influenced by study condition: in Study 2a, when the BMR question was asked closer to the mindfulness instructions, a significant effect of condition on BMR was observed. Although no such effect was observed in Study 2b, the possibility that participant responses were influenced by condition in that study cannot be excluded. If participants believe mindfulness has a religious component, then their own perspectives on religion are likely to impact their views of an MBI.

Implications of Individual Differences in Existential Quest and Scriptural Literalism

Existential Quest is typified by the perspective that one's existential outlook is unfixed and likely to change over time, and by expectations of change and growth in one's existential worldview. Correspondingly, this scale has been interpreted as an index of existential flexibility (Van Pachterbeke et al., 2012), yet it has also been associated with secularism (Sullivan, 2016). Consistent with study hypotheses (H1 & H2), across Studies 1a, 1b, and 2a, those higher in EQ tended to favor MBIs more overall, regardless of their framings. Moreover, EQ was associated with greater willingness to try Buddhist and secular framings of mindfulness in Studies 1a and 1b (H3). Scholarship on mindfulness in the US and Europe has observed a history of presenting mindfulness as consistent with secular, humanist teachings (McMahan, 2008), as well as an argument for the exceptionalism of mindfulness practices as being scientific and rational, as opposed to the religious dogmatism attributed to Christianity (Cho, 2011; Thompson, 2020). Articulators of secular, humanistic interpretations of Buddhism include prominent figures such as Harris (2014), Batchelor (2010), and the 14th Dalai Lama (Gyatso, 2011). Given its consistency with secular, humanist values, EQ may also overlap with perspectives consistent with Buddhist Modernism (McMahan, 2008). This may also help to explain the associations between EQ and positive responses to mindfulness overall.

Truth of Texts and Teachings provides an index of scriptural literalism. Scriptural literalism may be considered a marker of exclusionary commitment to one's religious and existential worldviews (Marty & Appleby, 1994; Streib, 2010). Given that recruitment was open to participants from any faith tradition, but that study participants were predominantly either Christian or non-religious (atheist, non-affiliated, or agnostic), TTT is more likely to have represented more conservative Christian religious perspectives in this sample. In the US scriptural literalism is a tenet of more conservative religious movements, and is one of the

“fundamentals” of Christian fundamentalism (Marty & Appleby, 1994). Accordingly, relationships between TTT and willingness to try mindfulness with different framings likely reflect a tendency observed elsewhere (Brown, 2016) for conservative Christians to reject practices that appear to derive from other traditions. Consistent with study hypothesis H5, TTT predicted willingness to try spiritual mindfulness and mindfulness from one’s own tradition, and unfavorable attitudes toward secular and Buddhist mindfulness (Studies 1a and 1b). This pattern did not uphold under experimental conditions in Studies 2a and 2b: we did not find support for the study hypothesis for H6 that TTT would predict greater acceptability of spiritual mindfulness, and lower acceptability of secular and Buddhist mindfulness. As previously noted, this may indicate that TTT may matter more in the selection of an MBI than in response to it.

Limitations and Future Directions

The primary limitations of this study concern its restricted range of participants. These studies were conducted in the US and enrolled primarily Christian or Secular/Agnostic participants. Therefore, results are primarily reflective of attitudes among these two groups and cannot be used to characterize how individuals from other backgrounds, such as Buddhists or Hindus, might have responded. Further, this research relied upon college student and MTurk study populations, restricting the generalizability of these findings (Colman et al., 2018; Goodman et al., 2013; Mason & Suri, 2012). There is empirical evidence of decline in MTurk data quality beginning in Summer 2018 (Chmielewski & Kucker, 2020). Although the present research was conducted in 2016 (Study 1a) and 2017 (Study 2b) and made use of attention checks as well as a computer audio tests to minimize data integrity concerns associated with MTurk, limitations specific to MTurk samples cannot be altogether disregarded. The possibility of self-selection into the study due to interest in mindfulness also cannot be excluded. For

instance, the percentage of participants with prior experience with mindfulness across studies ranged from 54.8% (Study 2b) to 68.3% (Study 1b, see Supplementary Document I for details), which are somewhat higher than recent epidemiological data in Goldberg, et al. (2021b), where 49.3% of a comparable sample reported prior experience with meditation. Further, Studies 1a and 1b used a cross-sectional design where all participants were exposed to all mindfulness framings, and thus causality cannot be established from those studies.

As previously noted, this research focused on dimensional rather than categorical/affiliative indices of religiosity in order to attempt to cut across religious groupings. With this aim in mind, the study recruitment strategies and samples were not optimized for testing fine-grained differences between religious affiliation groups. Future research should address this issue by recruiting from specific religious affiliations, enrolling religious congregations (for example, see Lefevor et al., 2019), or using post-hoc typologies of religious affiliations if larger samples than the present study are available (Steensland et al., 2000). A related issue concerns the fact that these studies relied entirely upon survey-based psychological measures. Mono-method measurement approaches confer a risk of shared method variance, which can create spurious or artificially inflated effects caused by semantic commonalities between instruments (Mehl & Connor, 2012; Podsakoff et al., 2012). Participants' responses to survey measures may also not translate to their behaviors in real life. Further research can address these concerns by incorporating objectively assessed psychosocial measures such as naturalistic assessments of daily behavior and language use, which have been successfully used in other recent research in contemplative science (Kaplan et al., 2018; Polsinelli et al., 2022; Mascaro et al., 2022a).

It is also important to contextualize our results in light of differences in the religious attributes of the different study samples. Consistent with findings from other MTurk research

(Goodman et al. 2013), Studies 1a and 2a had more unaffiliated participants than their college student counterpart samples, and fewer Catholics. Taken together with the positive skew observed in TTT, it is possible that the kinds of individuals who would ordinarily score in the higher ranges of TTT were under-represented in this research. The college samples were considerably smaller, and college students tend to be (though not uniformly: Uecker et al., 2007) more secular than the general population (Denton et al., 2008). It is also not clear whether TTT is truly a measure of the same construct in highly religiously conservative populations as contrasted with college students and MTurk workers, and to our knowledge there are no examinations of measurement invariance between college students vs. conservatively religious individuals to date (although invariance was demonstrated between de-converted and affiliated individuals: Streib et al., 2010).

The use of different mindfulness scripts in Studies 2a and 2b provides a way to test differences in framings, but introduces potential confounds into research as well. For instance, it is possible that the minor changes that were introduced to the scripts inadvertently also provided alternate foci for meditation, thus changing elements of the intervention other than its framing. Further, the mindfulness scripts were not specifically oriented toward participants' own religious traditions. Although not the purpose of this study (which was to assess participants' responses to content that they specifically did *not* come up with), scenarios using emic language, and even liturgical content suggested by participants and their clergy—might have a far higher degree of acceptance.

Finally, MBIs constitute a wide range of interventions beyond web-based delivery, including group classes, individual psychotherapy modalities, and brief intervention approaches. Responses to a brief, online intervention might not generalize to longer MBIs, or to MBIs

delivered in-person. Relatedly, MBIs target and are typically directed toward a range of pathologies (Wielgosz et al., 2019). This study was conducted with non-clinical populations, and generalization to clinical populations cannot be assumed. Moreover, given that this was not a treatment study, these results cannot speak to the clinical significance of religious and spiritual attributes in MBIs. Nevertheless, participant uptake is important for recruitment, as well as adherence, which is an important predictor of MBI outcomes (Lacaille et al., 2018).

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Compliance with Ethical Standards

Ethical Approval

All research reported in this article was approved by the University of Arizona Institutional Review Board (IRB).

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Conflict of Interest

The authors do not have any conflict of interest to report.

Informed Consent

All participants provided informed consent for participating in this research. Informed consent procedures were also approved by the University of Arizona IRB.

Author Contributions

RP: co-designed the study, conducted the data analyses, and co-wrote paper drafts. DMK: co-designed the study and co-wrote paper drafts. SAB: conducted preliminary analyses, contributed to study development and execution, and provided feedback on paper drafts. JSM: Provided expertise on MBIs in religiously affiliated populations and revised drafts. MRM: Provided methodological, quantitative, and design guidance, and contributed to revisions of the manuscript. DS: Provided methodological, quantitative, and design guidance, facilitated the execution of the study in his lab, and contributed to revisions of the manuscript.

Data Availability Statement

Study data are available on Figshare repository: <https://figshare.com/s/36f1a4485806fc061267>
Individuals interested in these data are encouraged to contact the corresponding author.

References

- Anderson, M. R., Kaplan, D. M., Palitsky, R. (in press). Religious and existential determinants of affective response to a brief mindfulness intervention. *Affective Science*
- Batchelor, S. (2010). *Confession of a Buddhist atheist*. Random House Publishing Group.
- Brown, C. G. (2016). Can “Secular” mindfulness be separated from religion? In R. E. Purser, D. Forbes, A. Burke (Eds.) *Handbook of Mindfulness* (pp. 75–94). Springer, Cham. DOI: 10.1007/978-3-319-44019-4_6
- Brown, C. G. (2019). *Debating yoga and mindfulness in public schools: Reforming secular education or reestablishing religion?* UNC Press Books.
- Practice*, 25, 59–67. <https://doi.org/10.1016/j.ctcp.2016.08.007>
- Burnett-Zeigler, I. E., Hong, S., Waldron, E. M., Maletich, C., Yang, A., & Moskowitz, J. (2019). A Mindfulness-Based Intervention for Low-Income African American Women with Depressive Symptoms Delivered by an Experienced Instructor Versus a Novice Instructor. *Journal of Alternative and Complementary Medicine (New York, N.Y.)*, 25(7), 699–708. <https://doi.org/10.1089/acm.2018.0393>
- Burnett-Zeigler, I. E., Satyshur, M. D., Hong, S., Yang, A., T Moskowitz, J., & Wisner, K. L. (2016). Mindfulness based stress reduction adapted for depressed disadvantaged women in an urban Federally Qualified Health Center. *Complementary Therapies in Clinical*
- Burke, A. (2012). Comparing individual preferences for four meditation techniques: Zen, Vipassana (Mindfulness), Qigong, and Mantra. *EXPLORE*, 8(4), 237–242. DOI: [10.1016/j.explore.2012.04.003](https://doi.org/10.1016/j.explore.2012.04.003)
- Burke, A., Lam, C. N., Stussman, B., & Yang, H. (2017). Prevalence and patterns of use of mantra, mindfulness and spiritual meditation among adults in the United States. *BMC*

- Complementary and Alternative Medicine*, 17(1), 316. <https://doi.org/10.1186/s12906-017-1827-8>
- Carrette, J. R., & King, R. (2005). *Selling spirituality: The silent takeover of religion* (1st ed). Routledge.
- Castellanos, R., Yildiz Spinel, M., Phan, V., Orengo-Aguayo, R., Humphreys, K. L., & Flory, K. (2020). A systematic review and meta-analysis of cultural adaptations of mindfulness-based interventions for Hispanic populations. *Mindfulness*, 11(2), 317–332. <https://doi.org/10.1007/s12671-019-01210-x>
- Chmielewski, M., & Kucker, S. C. (2020). An MTurk crisis? Shifts in data quality and the impact on study results. *Social Psychological and Personality Science*, 11(4), 464–473. <https://doi.org/10.1177/1948550619875149>
- Cho, F. (2011). Buddhism and science: translating and re-translating culture. In D. McMahan (Ed.) *Buddhism in the Modern World*. Routledge.
- Colman, D. E., Vineyard, J., & Letzring, T. D. (2018). Exploring beyond simple demographic variables: Differences between traditional laboratory samples and crowdsourced online samples on the big five personality traits. *Personality and Individual Differences*, 133, 41–46. <https://doi.org/10.1016/j.paid.2017.06.023>
- Compson J.F. (2017) Is mindfulness secular or religious, and does it matter?. In: L. Monteiro, J. Compson, F. Musten. (eds) *Practitioner's guide to ethics and mindfulness-based interventions*. Mindfulness in Behavioral Health. Springer, Cham DOI: 10.1007/978-3-319-64924-5_2
- Creswell, J. D. (2017). Mindfulness interventions. *Annual Review of Psychology*, 68(1), 491–516. DOI: [10.1146/annurev-psych-042716-051139](https://doi.org/10.1146/annurev-psych-042716-051139)

- Denton, M. L., Pearce, L. D., & Smith, C. (2008). Religion and spirituality on the path through adolescence, research report number 8. National Study of Youth and Religion, University of North Carolina at Chapel Hill.
- Doren, N. V., Oravec, Z., Soto, J. A., & Roeser, R. W. (2021). Examining the cultural consensus on beliefs about mindfulness among US early adults. PsyArXiv.
<https://doi.org/10.31234/osf.io/p27xk>
- Dutton, M. A., Bermudez, D., Matás, A., Majid, H., & Myers, N. L. (2013). Mindfulness-Based Stress Reduction for Low-Income, Predominantly African American Women With PTSD and a History of Intimate Partner Violence. *Cognitive and Behavioral Practice, 20*(1), 23–32. <https://doi.org/10.1016/j.cbpra.2011.08.003>
- 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*(8), 1090–1106.
DOI: [10.1177/1359105313508459](https://doi.org/10.1177/1359105313508459)
- Goldberg, S. B., Lam, S. U., Britton, W. B., & Davidson, R. J. (2021a). Prevalence of meditation-related adverse effects in a population-based sample in the United States. *Psychotherapy Research: Journal of the Society for Psychotherapy Research, 1–15*.
<https://doi.org/10.1080/10503307.2021.1933646>
- Goldberg, S. B., Riordan, K. M., Sun, S., & Davidson, R. J. (2021b). The empirical status of mindfulness-based interventions: A systematic review of 44 meta-analyses of randomized controlled trials. *Perspectives on Psychological Science*.
<https://doi.org/10.1177/1745691620968771>

- Goodman, J. K., Cryder, C. E., & Cheema, A. (2013). Data collection in a flat world: The strengths and weaknesses of Mechanical Turk samples. *Journal of Behavioral Decision Making*, 26(3), 213–224. <https://doi.org/10.1002/bdm.1753>
- Gosling, S. D., Rentfrow, P. J., & Swann, W. B., Jr. (2003). A very brief measure of the big five personality domains. *Journal of Research in Personality*, 37, 504–528. [https://doi.org/10.1016/S0092-6566\(03\)00046-1](https://doi.org/10.1016/S0092-6566(03)00046-1)
- Gyatso, T. (2011). *Beyond religion: Ethics for a whole world*. Houghton Mifflin Harcourt.
- Harrington, A., & Dunne, J. D. (2015). When mindfulness is therapy: Ethical qualms, historical perspectives. *American Psychologist*, 70(7), 621–631. DOI: [10.1037/a0039460](https://doi.org/10.1037/a0039460)
- Harris, S. (2014). *Waking up: A guide to spirituality without religion*. Simon and Schuster.
- Hathaway, W., & Tan, E. (2009). Religiously oriented mindfulness-based cognitive therapy. *Journal of Clinical Psychology*, 65(2), 158–171. DOI: [10.1002/jclp.20569](https://doi.org/10.1002/jclp.20569)
- Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis*. The Guilford Press
- Hayes, A. F., & Montoya, A. K. (2017). A tutorial on testing, visualizing, and probing an interaction involving a multicategorical variable in linear regression analysis. *Communication Methods and Measures*, 11(1), 1–30. DOI: 10.1080/19312458.2016.1271116
- Hayes, S. C., & Shenk, C. (2004). Operationalizing mindfulness without unnecessary attachments. *Clinical Psychology: Science and Practice*, 11(3), 249–254. <https://doi.org/10.1093/clipsy.bph079>

- Kabat-Zinn, J. (2011). Some reflections on the origins of MBSR, skillful means, and the trouble with maps. *Contemporary Buddhism*, 12(1), 281–306.
<https://doi.org/10.1080/14639947.2011.564844>
- Kaplan, D. M., Raison, C. L., Milek, A., Tackman, A. M., Pace, T. W. W., & Mehl, M. R. (2018). Dispositional mindfulness in daily life: A naturalistic observation study. *PLoS ONE*, 13(11), e0206029. <https://doi.org/10.1371/journal.pone.0206029>
- Knabb, J. J. (2010). Centering prayer as an alternative to Mindfulness-Based Cognitive Therapy for depression relapse prevention. *Journal of Religion and Health*, 51(3), 908–924.
DOI: [10.1007/s10943-010-9404-1](https://doi.org/10.1007/s10943-010-9404-1)
- Lacaille, J., Sadikaj, G., Nishioka, M., Carrière, K., Flanders, J., & Knäuper, B. (2018). Daily mindful responding mediates the effect of meditation practice on stress and mood: The role of practice duration and adherence. *Journal of Clinical Psychology*, 74(1).
DOI: [10.1002/jclp.22489](https://doi.org/10.1002/jclp.22489)
- Lefevor, G. T., Sorrell, S. A., Virk, H. E., Huynh, K. D., Paiz, J. Y., Stone, W.-M., & Franklin, A. (2019). How do religious congregations affect congregants' attitudes toward lesbian women and gay men? *Psychology of Religion and Spirituality*.
<https://doi.org/10.1037/rel0000290>
- Lindahl, J. R. (2014). Why right mindfulness might not be right for mindfulness. *Mindfulness*, 6(1), 57–62. DOI 10.1007/s12671-014-0380-5
- Marty, M. E. & Appleby, R. S. (Eds.). (1994). *Fundamentalisms observed*. University Of Chicago Press.
- Mascaro, J. S., Palmer, P. K., Ash, M. J., Peacock, C., Sharma, A., Escoffery, C., & Raison, C. (2021). Feasibility, acceptability, and preliminary effectiveness of a compassion-centered

- team intervention to improve clinical research coordinator resilience and well-Being. *JCO Oncology Practice*, 17(7), e936–e946. <https://doi.org/10.1200/OP.21.00120>
- Mascaro, J. S., Palmer, P. K., Willson, M., Ash, M. J., Florian, M. P., Srivastava, M., ... & Raison, C. L. (2022a). The Language of Compassion: Hospital Chaplains' Compassion Capacity Reduces Patient Depression via Other-Oriented, Inclusive Language. *Mindfulness*, 1-14.
- Mascaro, J. S., Florian, M. P., Ash, M. J., Palmer, P. K., Sharma, A., Kaplan, D. M., Palitsky, R., Grant, G., & Raison, C. L. (2022b). Learning Compassion and Meditation: A Mixed-Methods Analysis of the Experience of Novice Meditators. *Frontiers in Psychology*, 13. <https://www.frontiersin.org/articles/10.3389/fpsyg.2022.805718>
- Mason, W., & Suri, S. (2012). Conducting behavioral research on Amazon's Mechanical Turk. *Behavior Research Methods*, 44(1), 1–23. <https://doi.org/10.3758/s13428-011-0124-6>
- McMahan, D. L. (2008). *The making of Buddhist modernism*. Oxford University Press.
- Mehl, M. R., & Conner, T. S. (2012). *Handbook of research methods for studying daily life*. Guilford Press.
- Monteiro, L. M., Musten, R. F., & Compson, J. (2014). Traditional and contemporary mindfulness: Finding the middle path in the tangle of concerns. *Mindfulness*, 6(1), 1–13. DOI 10.1007/s12671-014-0301-7
- Palitsky, R., & Kaplan, D. M. (2021). The role of religion for mindfulness-based interventions: Implications for dissemination and implementation. *Mindfulness*, 12(8), 2076–2089. <https://doi.org/10.1007/s12671-019-01253-0>

- Pinheiro J, Bates D, DebRoy S, Sarkar D, R Core Team (2020). *nlme: Linear and nonlinear mixed effects models*. R package version 3.1-151, <https://CRAN.R-project.org/package=nlme>.
- 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.
- Polsinelli, A. J., Kaplan, D. M., & Mehl, M. R. (2022). The language of mindfulness: Studying contemplative experience through natural language. In M. Dehghani & R. L. Boyd (Eds.), *Handbook of language analysis in psychology* (pp. 429–444). The Guilford Press.
- Proctor, E., Silmere, H., Raghavan, R., Hovmand, P., Aarons, G., Bunger, A., Griffey, R., & Hensley, M. (2011). Outcomes for implementation research: Conceptual distinctions, measurement challenges, and research agenda. *Administration and Policy in Mental Health*, 38(2), 65–76. DOI: [10.1007/s10488-010-0319-7](https://doi.org/10.1007/s10488-010-0319-7)
- Proulx, J., Croff, R., Oken, B., Aldwin, C. M., Fleming, C., Bergen-Cico, D., Le, T., & Noorani, M. (2018). Considerations for research and development of culturally relevant mindfulness interventions in American minority communities. *Mindfulness*, 9(2), 361–370. DOI [10.1007/s12671-017-0785-z](https://doi.org/10.1007/s12671-017-0785-z)
- Sauer, B., Brookhart, M. A., Roy, J. A., & VanderWeele, T. J. (2013). Covariate selection. In *Developing a protocol for observational comparative effectiveness research: A user's guide*. Agency for Healthcare Research and Quality (US). <https://www.ncbi.nlm.nih.gov/books/NBK126194/>

- Steensland, B., Park, J. Z., Regnerus, M. D., Robinson, L. D., Wilcox, W. B., & Woodberry, R. D. (2000). The measure of American religion: Toward improving the state of the art. *Social Forces*, 79(1), 291–318. <https://doi.org/10.2307/2675572>
- Streib, H., Hood, R., & Klein, C. (2010). The religious schema scale: Construction and initial validation of a quantitative measure for religious styles. *The International Journal for the Psychology of Religion*, 20(3), 151–172. <https://doi.org/10.1080/10508619.2010.481223>
- Sullivan, D. (2016). *Cultural-existential psychology: The role of culture in suffering and threat*. Cambridge University Press.
- Thompson, E. (2020). *Why I am not a Buddhist*. Yale University Press.
- Uecker, J. E., Regnerus, M. D., & Vaaler, M. L. (2007). Losing my religion: The social sources of religious decline in early adulthood. *Social Forces*, 85(4), 1667–1692. <https://doi.org/10.1353/sof.2007.0083>
- UCLA Mindful Awareness Research Center (2011) *Breathing meditation*. Retrieved from <https://www.uclahealth.org/marc/mindful-meditations>
- Van Pachterbeke, M., Keller, J., & Saroglou, V. (2012). Flexibility in existential beliefs and worldviews: Introducing and measuring existential quest. *Journal of Individual Differences*, 33(1), 2–16. <https://doi.org/10.1027/1614-0001/a000056>
- Wielgosz, J., Goldberg, S. B., Kral, T. R. A., Dunne, J. D., & Davidson, R. J. (2019). Mindfulness meditation and psychopathology. *Annual Review of Clinical Psychology*, 15(1). DOI: [10.1146/annurev-clinpsy-021815-093423](https://doi.org/10.1146/annurev-clinpsy-021815-093423)

Table 1. Representative Excerpts from Scripts for Each Condition

Experimental Condition	Representative excerpt from script
Secular Framing Condition	This is a mind-body mindfulness practice It is a scientifically validated way to find calm Through the experience of your own breath
Spiritual Framing Condition	This is a mind-body-spirit mindfulness meditation It is a way to find spiritual grounding In the experience of your own breath
Buddhist Framing Condition	This is a mind-body mindfulness meditation It is grounded in the Buddhist practice called Shamata Calming the mind through observing the breath

Note. Full scripts for all conditions are available in Supplementary Document I.