Motivation for Meditation and its Association with Meditation Practice in a National Sample of Internet Users

Zishan Jiwani[1,2], Sin U Lam[1,2], Richard, J. Davidson[2,3] & Simon B. Goldberg[1,2*]

[1]Department of Counseling Psychology, University of Wisconsin - Madison

[2]Center for Healthy Minds, University of Wisconsin - Madison

[3]Department of Psychology, University of Wisconsin – Madison

*Corresponding Author

Author note

RJD is the founder, president, and serves on the board of directors for the non-profit organization, Healthy Minds Innovations, Inc. This research was supported by grant K23AT010879 (SBG) and U24AT011289-01 (RJD) from the National Center for Complementary and Integrative Health. Simon Goldberg was supported in part by the Hope for Depression Research Foundation 'Defeating Depression' Award. Additional support for this research was provided by the Graduate School, part of the Office of Vice Chancellor for Research and Graduate Education at the University of Wisconsin-Madison, with funding from the Wisconsin Alumni Research Foundation and the UW-Madison.

ZJ: conducted the formal analysis and wrote the original manuscript draft. SUL: collaborated on the study conceptualization and methodology and reviewed and edited manuscript draft. RJD: collaborated on the study conceptualization and methodology and reviewed and edited manuscript draft. SBG: supervised the study, led the study conceptualization and methodology, supervised the formal analysis, and reviewed and edited manuscript draft.

All data and code used for analysis are available at the Open Science Framework (https://osf.io/djpn4/?view_only=063893e0094b4fcbbb018d1a53bea55f).

Authors would like to express gratitude to Qiang Xie and Shobhali Thapa for the conversation which inspired this study.

Correspondence can be addressed to Simon B. Goldberg, Department of Counseling Psychology, University of Wisconsin-Madison, 335 Education Building, 1000 Bascom Mall, Madison, Wisconsin, 53706, United States. Email: sbgoldberg@wisc.edu

Abstract

Objectives: There is limited understanding of what motivates people to initiate and sustain a meditation practice. This study investigates initial and current motivations for meditation, demographic variability in motivations, and associations with ongoing and lifetime meditation practice. **Methods:** A national sample of internet users were recruited to examine initial and current motivations for meditation practice. **Results**: 953 participants completed initial screening and 470 (49.3%) reported exposure to meditation practice. 434 (92.3%) completed a follow-up assessment. Participants most frequently reported mental health/stress alleviation as an initial motivation (n = 322, 74.2%) followed by spiritual (n = 122, 28.1%), physical health (n = 69, 15.9%), awakening/enlightenment (n = 64, 14.7%), cultural (n = 51, 11.8%) and other (n = 33, 7.6%). Participants reported a mean of 1.52 (SD = 0.83) initial motivations. Among those currently meditating, a significant increase in the number of motivations was found between initial and current motivations (1.60 [SD = 0.89] and 2.11 [SD = 1.16]), for initial and current motivations, respectively, Cohen's d = 0.45). The number of motivations was positively associated with meditation practice. Initial mental health motivation was found to be negatively associated with current and lifetime meditation practice, whereas spiritual motivation was found to be positively associated. **Conclusions**: While meditation started as a tool for spiritual attainment, findings suggest that it is predominantly used in the U.S. for mental health support and to manage stress. Findings suggest that both type and number of motivations may relate to the course of practice.

Keywords: motivation, meditation, mindfulness, mental health, national survey

Motivation for Meditation and its Association with Meditation Practice in a National Sample of Internet Users

Setting the right motivation or intention for meditation practice has been an important facet of Buddhist practice since the time of the Buddha and continues to be emphasized across modern schools of Buddhism (Damdul, 2018; Sirimanne, 2018). In the *Dhammapada*, derived from the *Pāli Canon*, the sacred scriptures of the *Theravada* school, the Buddha encourages adherents to set their intent towards enlightenment, and negative mental states which cloud the mind, such as fear, anger, anxiety, and jealously will diminish (Buddharakkhita, 1985). Similarly, in the Mahayana tradition, it is advised to begin each practice by setting the right motivation to awaken the Buddha nature within oneself, which is a path to the removal of negative mental states from the mind (Damdul, 2018). However, as meditation has become popularized in the West, it has been largely disconnected from Buddhist philosophy and ethics and has been presented as a secular biomedical intervention to improve psychological and physiological well-being (Kabat-Zinn, 2011; Kirmayer, 2015; Sirimanne, 2018). Research on the generally positive impact of mindfulness-and-meditation-based interventions has been well documented in clinical settings (Goldberg et al., 2018; Koncz et al., 2021) as well as within education (Breedvelt et al., 2019), the workplace (Lomas et al., 2019) and military and veteran settings (Goldberg et al., 2020; L.-N. Sun et al., 2021). Specifically, benefits documented include improvements in attention (Sumantry & Stewart, 2021), emotion regulation (Zhang et al., 2019), physical health (Edwards & Loprinzi, 2018), and psychological well-being (Gál et al., 2021; Galante et al., 2014; Goldberg et al., 2018, 2020).

Spurred in part by research, meditation has become popular in the U.S. Between 2012 and 2017, the number of U.S. adults reporting the use of meditation has grown more than

threefold from 4.1% to 14.2%, according to the National Health Interview Survey (NHIS, Clarke et al., 2018). NHIS limits meditation practices to mindfulness meditation, mantra meditation, and spiritual meditation (Burke et al., 2017) as these meditation styles represent the most commonly practiced forms of meditation (Burke et al., 2017; Stussman et al., 2013). More recently, a national survey by the American Psychiatric Association revealed that a quarter of Americans planned a mental-health-related new year's resolution in 2022, and within this group, 53% planned to engage in meditation practice (American Psychiatric Association, 2021). Simultaneously, curiosity about meditation has also increased interest in Buddhism in the U.S., which is evidenced by the growing number of spiritual centers which teach the spiritual tenets of Buddhism and encourage the pursuit of enlightenment (Gelles, 2019; H.G., 2018). Given the various ways one may be exposed to meditation practice, motivations for meditation practice may vary across the population, and it is possible that an individual's motivation for meditation may influence the course and outcome of an individual's practice (Godlaski, 2018; Pepping et al., 2016).

Research on the motivations for meditation has been fairly limited. Shapiro (1992) proposed a motivation continuum whereby those practicing meditation would gradually move from an initial motivation of self-regulation to self-exploration and finally to self-liberation. Carmody et al. (2009) attempted to empirically test this hypothesis in a sample of 309 participants who were recruited from a mindfulness-based stress reduction (MBSR) program and found that participants reported high levels for all three types of motivations with little variability. More recently, Schmidt (2014) assessed motivations across 549 meditators in an online survey in Germany and found four factors similar to what had been proposed by Shapiro (1992) with the pursuit of well-being as an additional factor. The well-being factor was found to

be negatively associated with meditation experience (in number of months), whereas the self-transformation factor was positively associated (Schmidt, 2014), which highlights the possibility that motivations may be associated with the course of an individual's practice. Improving mental health and well-being were also predominant motivations found across more recent studies in addition to physical well-being, spiritual growth, and cultural motivations (Pepping et al., 2016; Sedlmeier & Theumer, 2020). Furthermore, contrary to Shapiro (1992), Pepping et al. (2016), also found that the motivation for meditation changed over time. Examining initial and current motivations for practice, Pepping et al. (2016) found that psychological well-being became more prevalent and spiritual motivation became less prevalent in a sample of university students with exposure to meditation. Sedlmeier and Theumer (2020), in their sample of experienced meditators recruited through meditation centers in Germany, found that motivations do shift from self-regulation to spirituality, but only for participants with a Buddhist or spiritual background.

The aforementioned studies have laid important groundwork to understand motivations for meditation but also have important limitations. Most importantly, most of the studies recruited convenience samples of active meditators or individuals who were participating in a meditation intervention (Carmody et al., 2009; Schmidt, 2014; Sedlmeier & Theumer, 2020; Shapiro, 1992). Importantly, these sampling approaches may exclude individuals who may have started meditating but eventually stopped. Pepping et al. (2016) recruited participants in a university setting and included individuals who had started and stopped meditation, but the sample was young (M_{age} = 21.34, SD = 5.76) and unlikely to be representative of the general population. Given the lack of samples drawn from the general population, it remains unclear to what extent prior findings might be shaped by self-selection bias. Additionally, to our

knowledge, none of the studies have reported variability in motivation across important demographic variables such as race and ethnicity, gender, income, and age. If motivation is found to be varied across demographic groups, then it can support additional efforts to culturally adapt interventions and improve access for minoritized and marginalized groups (S. Sun et al., 2021). Finally, only Schmidt (2014) has examined the association between motivation and sustained practice. If motivation and practice were found to be consistently associated across several samples, it might guide efforts to improve access and sustained adherence to meditation practice.

This paper has four objectives. First, we aim to assess the initial motivations for practice for all individuals exposed to meditation practice as well as current motivations for those with an ongoing practice in a national sample of internet users. Second, building on prior work on motivations (Carmody et al., 2009; Pepping et al., 2016; Schmidt, 2014; Sedlmeier & Theumer, 2020; Shapiro, 1992), we aim to assess if and how motivations change over time for individuals with an ongoing practice. Third, we examine demographic correlates of initial motivations for all participants exposed to meditation and of current motivations for those with an ongoing practice. Finally, we aim to examine how initial and current motivations might be associated with the course of practice, namely current and lifetime practice amount.

Method

Participants

The sample was recruited on the Prolific platform (www.prolific.co, 2021), which allows for the recruitment of participants demographically representative of the U.S. population based on age, sex, and race. Prior research has found data collection from the Prolific platform to be more heterogenous, more research naïve, and more honest relative to other platforms such as

Amazon Mechanical Turk (Palan & Schitter, 2018; Peer et al., 2017). This study is part of a larger research effort to understand meditation practices in the U.S., and initial findings have been published elsewhere (Goldberg et al., 2022). A sample of 993 participants underwent initial screening for lifetime meditation practice, and 953 passed the attention check (see Table 1). Relative to the U.S. population (U.S. Census Bureau, 2021), the sample was found to be more educated (50.6% with a bachelor's degree vs. 32.1%), older (median age = 44.0 vs. 38.1), more likely to be non-Hispanic White (70.6% vs. 60.1%) and with higher income (median income = $40,000 vs. $34,103). African Americans (14.1% vs. 13.4%) and Asians (8.0% vs. 5.9%) were appropriately represented, whereas Hispanics and Latinx were underrepresented (6.0% vs. 18.5%), likely due to Prolific matching based on race but not on ethnicity.

A subsample of participants (n = 434) who reported lifetime exposure to meditation completed a follow-up survey and passed attention checks were included. Details of the subsample selection process are detailed in the Procedure section below. Subsample participants reported an average age of 43.77 (SD = 15.53), and a large proportion reported being college-educated (n = 247, 56.9%). A significant minority also reported income at or below the national poverty line (n = 187, 43.1%). The largest racial group was non-Hispanic White (n = 315, 72.6%), followed by African American (n = 56, 12.9%), Asian (n = 29, 6.7%), Latinx (n = 24, 5.5%) and multiracial (n = 9, 2.1%). Most participants reported having practiced in the last 30 days (n = 283, 65.2%) and a plurality reported having 11-100 hours of lifetime practice (n = 179, 41.2%). See Table 1 for the demographics of the full sample and the sub-sample.

Procedure

As noted, participants from the overall sample who reported any exposure to meditation were invited to complete a follow-up survey. NHIS definition of meditation was used and

participants who engaged in either mindfulness meditation, mantra meditation, or spiritual meditation were included (Burke et al., 2017). Nearly half the participants from the overall sample (n = 470, 49.3%) reported exposure to meditation in their lifetime, and 92.3% (n = 434) completed the follow-up survey and passed the attention checks. Attention checks designed to detect inattentiveness and random responding were incorporated in the initial screening survey ("I have been randomly selecting responses on this survey") and the follow-up survey ("Please select the leftmost response"). Participants who completed the follow-up survey were similar to non-completers in most demographic categories (age, gender, education income with the exception that non-Hispanic Whites were more likely to complete the survey (r = .15, p = .001). Study procedures were approved by the Institutional Review Board at the University of Wisconsin-Madison.

Measures

Demographics. Information on age, gender identity, education, annual income, and race/ethnicity were collected from each of the participants.

Motivation for Meditation Practice. Two separate items adapted from Pepping et al. (2016) were used to assess participants' initial and current motivation for meditation. Participants were given six possible motivations for meditation, including (1) physical health, (2) mental/emotional health, or stress reduction, (3) social, cultural, or religious identity, (4) spiritual or self-transformation goals, (5) pursuit of enlightenment, awakening, or other ultimate goal and (6) other. Participants could select as many reasons as were applicable to them for initial and current motivation. For participants who do not currently practice meditation, a separate checkbox was included in the item assessing current motivation stating, "I do not currently practice meditation."

Meditation Practice. Participant meditation practice was assessed for those participants reporting lifetime exposure to meditation practice. Participants were asked about the number of days per week they practiced meditation in the 30 days preceding the survey (response options: 0-7). Additionally, participants were asked about their total lifetime hours of practice (response options 1-10, 11-100, 101-500, 501-1000, 1001-5000, 5000+). For analysis, lifetime hours were dichotomized to high and low lifetime hours categories at the median. Categories 1-10 and 1-100 were coded as low lifetime hours (0 in our analyses) and all other categories were coded as high (1 in our analyses).

Data Analysis

Data were analyzed in R statistical software program (R Core Team, 2021). All data and code used for analysis are available at the Open Science Framework (https://osf.io/djpn4/?view_only=1249d4df5e8e4ba1b27158d7b5fea647). Demographic measures, except for age, were dichotomized to be used as covariates. Specifically, reference groups were established for each of the covariates: gender (non-male), income (above per capita median income [$34,103], U.S. Census Bureau, 2021), race/ethnicity (reported racial/ethnic group), and education (non-college-educated).

To assess change in motivation between initial and current motivation, McNemar chi-squared tests were conducted to examine change in motivation. McNemar tests are appropriate for paired dichotomous data (Lachenbruch, 2014) which is what participants provided. Paired sample t-tests (appropriate for paired continuous data) were conducted to assess change in the number of total motivations reported by participants. Correlation and point-biserial correlation coefficients were calculated to assess associations between demographic variables and initial and current motivation for meditation. We report zero-order correlation to examine associations

between motivations and demographic variables to provide a straightforward sense of how each demographic variable was related to initial and current motivations. However, as a sensitivity analysis, we included all demographic variables in a multiple regression analysis predicting motivations for practice controlling for other demographic variables.

Multiple regression was used to calculate the associations between initial and current motivations with current practice whereas logistic regression was used to assess the association between current and initial motivations with lifetime practice (dichotomized as low and high lifetime practice). When examining the associations between practice and motivations, we included demographic variables as covariates. Individuals who reported meditating at least once a week in the last 30 days were labeled as current meditators. All analyses involving current motivations were limited to the subsample of current meditators. Initial motivations were analyzed using the full sample which included both current meditators and non-current meditators, except when examining practice within the last 30 days which was analyzed for current meditators only.

We conducted two sets of sensitivity analyses aimed at evaluating whether current meditators and non-current meditators were distinct groups in regards to their initial motivations for practice and the linkages between initial motivations for practice and other study variables. First, we examined whether there were group differences in initial motivation between individuals with practice in the last 30 days relative to those who did not practice in the last 30 days. Second, we conducted tests of moderation to assess if the association between initial motivation and other study variables (demographic and lifetime practice) varied based on whether the individual had an ongoing practice in the last 30 days or not.

To control for the number of tests conducted and reduce the possibility of Type I errors, we implemented Benjamini and Hochberg's false discovery rate (FDR) adjustment for all primary analyses (Benjamini & Hochberg, 1995). Guidelines suggested by Cohen (1988, 1992) were followed to interpret the magnitude of effect sizes for continuous variables and guidelines by Chen et al. (2010) for interpretation of odds ratios.

Results

Initial and Current Motivation

The proportion of participant initial motivations are reported in Table 2 for the full sample as well as sub-sample of individuals who report having practiced in the last 30 days. On average, participants reported a mean of 1.52 (SD = 0.83) initial motivations. The largest proportion of participants reported having mental health as an initial motivation (n = 322, 74.2%) followed by spiritual (n = 122, 28.1%), physical health (n = 69, 15.9%), awakening/enlightenment (n = 64 14.7%), cultural (n = 51, 11.8%) and other (n = 33, 7.6%). For the sample of participants with a current practice, there was a significant increase in the number of current motivations reported (M = 2.11, SD = 1.16) relative to initial motivations (M = 1.60, SD = 0.89, M_{diff} = -0.51, $t(282)$ = -7.58, $p < .001$, Cohen's d = 0.45). Additionally, participants were more likely to report increases from initial to current motivations for all motivation categories with the exception of cultural motivation and other motivations. The largest differences between initial and current motivations were observed in physical health (19.4%, $p < .001$), followed by mental health (12.7%, $p < .001$), spiritual (11.3%, $p < .001$) and awakening (6.3%, $p = .008$).

Demographics and Motivation

Associations between demographic characteristics and initial and current motivation are presented in Table 3. Most demographic variables were not associated with any of the motivations to practice. However, initial mental health motivation was found to be negatively associated with age (r = -.28, p < .001), such that younger people were more likely to have mental health as an initial motivator to start meditating. This association was non-significant when examining current motivation for the sample with an ongoing practice (r = -.14, p > .05). Additionally, identifying as Asian was positively associated with cultural motivation (r = .13, p = .031) whereas identifying as non-Hispanic White was negatively associated with cultural motivation (r = -.14, p = .015). The aforementioned associations were significant even when included in multiple regression models predicting motivations while controlling for all demographic variables. None of the demographic variables were significantly associated with current motivations for practice.

Practice and Motivation

Associations between motivations and practice variables (practice in the 30 days prior to completing the survey and lifetime practice hours) were assessed using linear regression and logistic regression while covarying demographic variables including age, gender, race, income, and college education. Standardized betas (β), odds ratio (OR) and FDR-adjusted p-values are presented in Table 4. Examining initial motivations, there was a small to moderate magnitude negative association between initial mental health motivation and practice in the last 30 days (β = -.21, p = .003) and lifetime practice hours (OR = .50, p = .006). A similar negative association was observed between current mental health motivation and practice in the last 30 days (β = -.14, p = .031) but not between current mental health motivation and lifetime practice hours (OR = .739, p = .468). Conversely, initial motivation towards spiritual aims was positively associated

with greater reported practice in the last 30 days (β = .14, p = .034) and lifetime practice hours (*OR* = 2.14, p = .005) and the association extended to current motivation as well for practice in the last 30 days (β = .28, p < .001) and lifetime practice hours (*OR* = 2.54, p = .001). Initial motivation to achieve awakening or enlightenment was significantly associated with higher levels of lifetime practice hours (*OR* = 2.35, p = .006), but not practice in the last 30 days (β = .08, p = .249). Current awakening motivation was associated with practice in the last 30 days (β = .21, p = .002) and lifetime practice hours (β = .23, p < .001). There was a higher likelihood of engaging in greater lifetime hours of practice when expressing initial cultural motivation (*OR* = 2.19, p = .017) and current cultural motivation (*OR* = 6.36, p = .001). Initial physical health motivation was associated with greater likelihood of engaging in more lifetime hours (*OR* = 1.95 p = .017), but not with practice in the last 30 days (β = .07, p = .217). Current physical health motivation was positively associated with practice in the last 30 days (β = .18, p = .008) and lifetime practice hours (*OR* = 2.63, p = .001). Finally, we also assessed the association between number of motivations reported and practice and found that the total number of initial motivations was positively associated with lifetime practice hours (*OR* = 1.50, p = .002) but not practice in the last 30 days (β = .08, p = .198). On the other hand, the total number of current motivations was positively associated with practice in the last 30 days (β = .29, p < .001) and with lifetime practice hours (*OR* = 1.91, p < .001).

Sensitivity Analyses

We conducted sensitivity analyses to evaluate whether current meditators and non-current meditators were distinct groups. As stated in the Data Analysis subsection, only associations between initial motivation with demographics and lifetime practice amount used the full sample of current meditators and non-current meditators. For all other analyses, we utilized the

subsample of current meditators. For the sensitivity analyses, we first examined if there were differences in initial motivations between individuals who had a practice in the last 30 days relative to those who did not. Results are reported in Table 5. We found that being a current meditator was associated with a greater likelihood of endorsing awakening (*OR* = 2.93, *p* = .002) and spiritual motivation (*OR* = 1.84, *p* = .011). No differences were found for the other initial motivation types. Next, we conducted moderation tests to assess if the associations between initial motivations with demographic variables and lifetime practice amount varied by current meditator status. Only three of the 50 tests yielded significant results (6% of tests), which was similar to the proportion expected with a *p*-value threshold of .050 (i.e., 5% vs. 6%). Therefore, these moderators should be interpreted cautiously. We found that the associations between being low-income and endorsing an initial awakening motivation (*OR* = 0.17, *p* = .041) or initial cultural motivation (*OR* = 0.23, *p* = .036) were moderated by current meditator status such that low-income individuals without a current practice were more likely to endorse initial awakening and cultural motivations. We also found that the association between age and cultural motivation was moderated by current meditator status (*b* = 10.54, *p* = .033) such that older meditators were more likely to endorse cultural motivations. The associations between initial motivation and lifetime practice were not moderated by current meditator status.

Discussion

The present study examined motivations for meditation in a national sample of internet users. A better understanding of initial and ongoing motivations for meditation has the potential to improve access by clarifying factors associated with sustained meditation practice. Consistent with Pepping et al. (2016), our findings suggest that a large proportion of individuals (74.2%) are initially motivated to meditate to support their mental health and/or reduce stress. Furthermore,

contrary to the continuum hypothesis proposed by Shapiro (1992), mental health motivations in the present sample increased rather than decreased over time, which also aligns with Pepping et al. (2016). Additionally, we observed motivations related to physical health, spirituality, and the pursuit of enlightenment also increased significantly over time. The only type of motivation that did not increase was social, cultural, or religious motivation for meditation. One potential reason may be that cultural and religious motivations are related to demographic variables (e.g., religious beliefs in the family of origin) that may therefore be less likely to change over time. Finally, we also observed that meditators with an ongoing practice reported an increase in the number of current motivations relative to their initial motivations. This supports the notion that increases in the number of motivations may be a factor in sustained practice.

There are several potentially important implications related to these patterns of initial and current motivations. First, the large number of individuals pursuing meditation for mental health purposes aligns with the notion that meditation and mindfulness practice in the U.S. have been biomedicalized, that is, viewed primarily as a means to support mental health. While there are contemplative traditions that originated in the Western Judeo-Christian traditions (Kaplan, 1985; Schopen & Freeman, 1991), a majority of the meditation practices popular in the U.S. today stem from ancient India, where they were conceptualized as methods to support the pursuit of spiritual attainment. Nonetheless, at this time in the U.S., meditation is now one of the most popular forms of mental health support and stress reduction activities (American Psychiatric Association, 2021; Clarke et al., 2018), and most individuals may pursue meditation initially to support their mental health and well-being. Thus, our findings suggest that for most individuals exposed to meditation, framing the purpose of practice around mental health and well-being will likely align with people’s pre-existing motivation. Another potentially important finding is that for

individuals with an ongoing practice, the number of reported motivations increased. This tentatively suggests that individuals who continue to practice meditation find more reasons than their initial reasons to keep practicing. This finding counters the continuum hypothesis proposed by Shapiro (1992) and suggests what might be termed an accumulative hypothesis, whereby over time, individuals add motivations in the course of their practice. As has been proposed in the literature previously (Pepping et al., 2016; Sedlmeier & Theumer, 2020; Shapiro, 1992) and also observed in the current study, motivations may naturally shift over time. It may be helpful for meditation instructors and others who may be involved in referring people to meditation practice (e.g., health care providers) to be aware of this. It may be prudent to stay alert to the possibility that people may develop new reasons to practice, including spiritual motivations, and potentially be prepared to discuss these new motivations as they arise.

We also examined variability in motivation across several demographic categories. A better understanding of motivations across different groups may support the development of more contextually and culturally relevant mindfulness programs which could lead to greater adoption and perhaps increased effectiveness of meditation practice, particularly among minoritized groups (S. Sun et al., 2021). Our findings suggest younger people are more likely to initially pursue meditation for mental health reasons, which aligns with Pepping et al. (2016), who, in a sample of college students (M_{age} = 21.34, SD = 5.76) found that 94.7% endorsed a mental health motivation. Additionally, individuals identifying as Asian were more likely to initially pursue meditation for social, cultural, or religious reasons, whereas individuals identifying as non-Hispanic White were less likely to do so. This finding may be because one-third of Buddhists in the U.S. are Asian, whereas most non-Hispanic White people are Christian and are thus less likely to have a cultural, religious, or social motivation to initiate meditation

practice (Pew Research Center, 2014). Although it will be necessary to examine these possibilities in future studies, variability in initial motivation across demographic groups could ultimately be used in the cultural adaptation of meditation interventions in efforts to increase intervention accessibility and acceptability. However, it should be noted that none of the demographic variables were significantly associated with current motivations for practice, which suggests that demographic variables may have more to do with motivations to start meditation than factors that support continued practice. However, future research is clearly needed to further examine these possibilities.

We also examined the association between motivation and practice and found that reporting an initial motivation for spirituality was associated with a greater likelihood of ongoing practice and higher lifetime hours of meditation. Conversely, reporting an initial motivation to pursue meditation for mental health was associated with a lower likelihood of ongoing practice and lower lifetime hours of meditation. These findings align with Schmidt (2014), who also found a negative association between length of practice (measured in number of months) and the pursuit of meditation for mental health or well-being and a positive association between length of practice and pursuit of self-transformation. One possible explanation for a negative association between mental health motivations and practice amount (current and lifetime) is that individuals pursuing meditation for mental health may stop meditating once they feel better. If this were true, it would be analogous to the good-enough level model in psychotherapy, where patients discontinue treatment once their symptoms have improved (Barkham et al., 1996). Of course, longitudinal research is needed to confirm this possibility. Conversely, those with spiritual aims may be likely to continue practicing, given that spiritual attainment in Buddhism takes time, even, as suggested in Buddhist teachings, many lifetimes of consistent practice (Bodhi, 2005).

Finally, our study also suggests that the number of current motivations is associated with current and lifetime hours of practice. This provides tentative evidence for the accumulative hypothesis suggested earlier, whereby greater number of motivations are associated with a more enduring practice. One potential implication of these findings is that those developing or delivering meditation interventions to support mental health may consider including intervention components to support the cultivation of additional motivations. Doing so may help participants develop a more consistent practice. Of course, this possibility would need to be evaluated directly in a future study. Additionally, it is important to acknowledge that greater meditation practice is not necessarily helpful and may, at times, lead to adverse effects (Britton, 2019).

Limitations and Future Research

There are several limitations of the current study that must be acknowledged. First, given the cross-sectional nature of the data at hand, it is not possible to establish causal linkages between motivation and practice. Although some analyses included temporal precedence (e.g., initial motivation predicting current practice), these still relied on participant retrospection, which is vulnerable to bias (Shiffman et al., 2008). Future research could examine motivation and meditation practice longitudinally (e.g., examining initial motivations as predictors of persistence within a meditation-based intervention). Second, as laid out in the Participants section, the sample demographics in our survey did not match the current demographics in the U.S. in some dimensions, which limits the generalizability of the findings. Specifically, our sample was more educated, older, more likely to be non-Hispanic White, and with higher income. Furthermore, the sample was limited to internet users who may differ from the general population in a number of unmeasured ways. Third, the associations between motivations and demographic variables were relatively small in magnitude ($r < .3$) and exploratory in nature.

While an FDR procedure was utilized to adjust p-values for the large number of tests conducted, there is a chance that some findings are simply due to chance (i.e., Type I error). Fourth, while the study suggests the association between motivations and meditation practice may vary across motivation types, it remains unclear why certain motivations may be linked with meditation practice. Finally, we focused on only a small number of potential motivations for practice. Sedlmeier and Theumer (2020) suggested a larger number of more nuanced motivations for meditation that were not included in this study. For example, increased psychological well-being and stress reduction were considered separate motivations in their study, whereas they were part of the same category in the present study. It is possible that a more refined assessment of motivation types might yield additional associations absent in the current investigation.

There are several ways in which future studies may build on this work. Longitudinal designs may better illuminate any causal relationships between initial motivations and course of practice. Experimental approaches could also be utilized to test if motivations can influence the course of practice. For example, future studies could experimentally apply nudges or micro-interventions to boost the salience of a particular type of motivation. Such manipulations may help strengthen an existing motivation or induce a new motivation and thereby support sustained practice. The potential of using micro-interventions in this way would be consistent with prior work showing that micro-interventions can increase the positive affect associated with meditation practice and thereby support continued practice (Van Cappellen et al., 2020). Additionally, contrary to the continuum hypothesis proposed by Shapiro (1992), our findings indicate meditators with a long-term practice are likely to have more motivations than when they got started. However, the directionality of the relationship –whether practicing longer produces additional motivations or whether additional motivations encourage persistent practice – remains

an open question for future inquiries. Qualitative interviews may be especially valuable to elucidate why some motivations are more prevalent relative to others and how they motivate or are motivated by practice. It may be helpful to replicate the associations observed between demographics and motivation types. Samples with a larger proportion of people of color might allow a deeper and more highly powered investigation of varying motivations across demographic subgroups. Overall, a deeper understanding of motivations – initial and current – and their association with group identities and practice may help researchers and practitioners better predict the long-term course of an individual's practice and support meditation practitioners in achieving sustained benefits.

Conflict of Interest

Richard J. Davidson is the founder, president, and serves on the board of directors for the non-profit organization, Healthy Minds Innovations, Inc. No donors, either anonymous or identified, have participated in the design, conduct, or reporting of research results in this manuscript.

Ethics Approval

The institutional review boards of the University of Wisconsin–Madison approved the research described in this article (IRB # 2020-1368)

Informed Consent

All participants provided written informed consent before study activities commenced.

Author Contributions

ZJ: conducted the formal analysis and wrote the original manuscript draft. SUL: collaborated on the study conceptualization and methodology and reviewed and edited

manuscript draft. RJD: collaborated on the study conceptualization and methodology and reviewed and edited manuscript draft. SBG: supervised the study, led the study conceptualization and methodology, supervised the formal analysis, and reviewed and edited manuscript draft.

Data Availability Statement

All data and code used for analysis are available at the Open Science Framework (https://osf.io/djpn4/?view_only=1249d4df5e8e4ba1b27158d7b5fea647).

Acknowledgements

Authors would like to express gratitude to Qiang Xie and Shobhali Thapa for the conversation which inspired this study.

Funding Statement

This research was supported by grant K23AT010879 (SBG) and U24AT011289-01 (RJD) from the National Center for Complementary and Integrative Health. Simon Goldberg was supported in part by the Hope for Depression Research Foundation ‘Defeating Depression’ Award. Additional support for this research was provided by the Graduate School, part of the Office of Vice Chancellor for Research and Graduate Education at the University of Wisconsin-Madison, with funding from the Wisconsin Alumni Research Foundation and the UW-Madison.

References

American Psychiatric Association. (2021, December 20). *One in Four Americans Plans a Mental Health New Year's Resolution for 2022*. https://www.psychiatry.org/newsroom/news-releases/one-in-four-americans-plans-a-mental-health-new-year-s-resolution-for-2022

Barkham, M., Rees, A., Stiles, W. B., Shapiro, D. A., Hardy, G. E., & Reynolds, S. (1996). Dose–effect relations in time-limited psychotherapy for depression. *Journal of Consulting and Clinical Psychology, 64*(5), 927–935. https://doi.org/10.1037/0022-006X.64.5.927

Benjamini, Y., & Hochberg, Y. (1995). Controlling the false discovery rate: A practical and powerful approach to multiple testing. *Journal of the Royal Statistical Society. Series B (Methodological), 57*(1), 289–300.

Bodhi. (2005). *In the Buddha's Words: An Anthology of Discourses from the Pali Canon*. Simon and Schuster.

Breedvelt, J. J. F., Amanvermez, Y., Harrer, M., Karyotaki, E., Gilbody, S., Bockting, C. L. H., Cuijpers, P., & Ebert, D. D. (2019). The effects of meditation, yoga, and mindfulness on depression, anxiety, and stress in tertiary education students: A meta-analysis. *Frontiers in Psychiatry*, *10*, 193. https://doi.org/10.3389/fpsyt.2019.00193

Britton, W. B. (2019). Can mindfulness be too much of a good thing? The value of a middle way. *Current Opinion in Psychology*, *28*, 159–165. https://doi.org/10.1016/j.copsyc.2018.12.011

Buddharakkhita, A. (1985). *The Dhammapada: The Buddha's path to wisdom*. Buddhist Publication Society.

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

Carmody, J., Baer, R. A., Lykins, E. L. B., & Olendzki, N. (2009). An empirical study of the mechanisms of mindfulness in a mindfulness-based stress reduction program. *Journal of Clinical Psychology*, *65*(6), 613–626. https://doi.org/10.1002/jclp.20579

Chen, H., Cohen, P., & Chen, S. (2010). How big is a big odds ratio? Interpreting the magnitudes of odds ratios in epidemiological studies. *Communications in Statistics - Simulation and Computation*, *39*(4), 860–864. https://doi.org/10.1080/03610911003650383

Clarke, T. C., Barnes, P., Black, L., Stussman, B., & Nahin, R. (2018). Use of yoga, meditation, and chiropractors among U.S. adults aged 18 and over. *NCHS Data Brief*, *325*.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Routledge. https://doi.org/10.4324/9780203771587

Cohen, J. (1992). A power primer. *Psychological Bulletin*, *112*(1), 155–159. https://doi.org/10.1037/0033-2909.112.1.155

Damdul, D. (2018). *The blaze of non-dual Bodhicittas* (4th ed.). Tibet House.

Edwards, M. K., & Loprinzi, P. D. (2018). Comparative effects of meditation and exercise on physical and psychosocial health outcomes: A review of randomized controlled trials. *Postgraduate Medicine*, *130*(2), 222–228. https://doi.org/10.1080/00325481.2018.1409049

Gál, É., Ștefan, S., & Cristea, I. A. (2021). The efficacy of mindfulness meditation apps in enhancing users' well-being and mental health related outcomes: A meta-analysis of

randomized controlled trials. *Journal of Affective Disorders*, *279*, 131–142. https://doi.org/10.1016/j.jad.2020.09.134

Galante, J., Galante, I., Bekkers, M.-J., & Gallacher, J. (2014). Effect of kindness-based meditation on health and well-being: A systematic review and meta-analysis. *Journal of Consulting and Clinical Psychology*, *82*(6), 1101–1114. https://doi.org/10.1037/a0037249

Gelles, D. (2019, April 3). Overlooked no more: S.N. Goenka, who brought mindfulness to the West. *The New York Times*. https://www.nytimes.com/2019/04/03/obituaries/sn-goenka-overlooked.html

Godlaski, A. J. (2018). Exploring intentions and outcomes in a contemplative classroom: A qualitative study. *The Journal of Contemplative Inquiry, 5*(1), Article 1. https://journal.contemplativeinquiry.org/index.php/joci/article/view/143

Goldberg, S. B., Lam, S. U., Britton, W. B., & Davidson, R. J. (2022). Prevalence of meditation-related adverse effects in a population-based sample in the United States. *Psychotherapy Research*, *32*(3), 291–305. https://doi.org/10.1080/10503307.2021.1933646

Goldberg, S. B., Riordan, K. M., Sun, S., Kearney, D. J., & Simpson, T. L. (2020). Efficacy and acceptability of mindfulness-based interventions for military veterans: A systematic review and meta-analysis. *Journal of Psychosomatic Research, 138*, 110232. https://doi.org/10.1016/j.jpsychores.2020.110232

Goldberg, S. B., Tucker, R. P., Greene, P. A., Davidson, R. J., Wampold, B. E., Kearney, D. J., & Simpson, T. L. (2018). Mindfulness-based interventions for psychiatric disorders: A systematic review and meta-analysis. *Clinical Psychology Review*, *59*, 52–60. https://doi.org/10.1016/j.cpr.2017.10.011

H.G. (2018, April 13). An Asian religion gains popularity in the New World: Buddhism in America. *The Economist (Online)*. http://www.proquest.com/docview/2031453895/abstract/7CC7E5DC057F410CPQ/1

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, A. (1985). *Jewish Meditation: A Practical Guide*. Schocken Books.

Kirmayer, L. J. (2015). Mindfulness in cultural context. *Transcultural Psychiatry*, *52*(4), 447–469. https://doi.org/10.1177/1363461515598949

Koncz, A., Demetrovics, Z., & Takacs, Z. K. (2021). Meditation interventions efficiently reduce cortisol levels of at-risk samples: A meta-analysis. *Health Psychology Review*, *15*(1), 56–84. https://doi.org/10.1080/17437199.2020.1760727

Lachenbruch, P. A. (2014). McNemar test. In *Wiley Statsref: Statistics reference online*. John Wiley & Sons, Ltd. https://doi.org/10.1002/9781118445112.stat04876

Lomas, T., Medina, J. C., Ivtzan, I., Rupprecht, S., & Eiroa-Orosa, F. J. (2019). Mindfulness-based interventions in the workplace: An inclusive systematic review and meta-analysis of their impact upon wellbeing. *The Journal of Positive Psychology*, *14*(5), 625–640. https://doi.org/10.1080/17439760.2018.1519588

Palan, S., & Schitter, C. (2018). Prolific.ac—A subject pool for online experiments. *Journal of Behavioral and Experimental Finance*, *17*, 22–27. https://doi.org/10.1016/j.jbef.2017.12.004

Peer, E., Brandimarte, L., Samat, S., & Acquisti, A. (2017). Beyond the Turk: Alternative platforms for crowdsourcing behavioral research. *Journal of Experimental Social Psychology*, *70*, 153–163. https://doi.org/10.1016/j.jesp.2017.01.006

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*(2), 542–547. https://doi.org/10.1007/s12671-016-0490-3

Pew Research Center. (2014). Religion in America: U.S. religious data, demographics and statistics. *Pew Research Center's Religion & Public Life Project*. https://www.pewforum.org/religious-landscape-study/

Schmidt, S. (2014). Opening up meditation for science: The development of a meditation classification system. In S. Schmidt & H. Walach (Eds.), *Meditation – Neuroscientific approaches and philosophical implications* (Vol. 2). Springer International Publishing. https://doi.org/10.1007/978-3-319-01634-4

Schopen, A., & Freeman, B. (1991). Meditation: The forgotten Western Tradition. *Counseling and Values*, *36*(2), 123–134. https://doi.org/10.1002/j.2161-007X.1991.tb00969.x

Sedlmeier, P., & Theumer, J. (2020). Why do people begin to meditate and why do they continue? *Mindfulness*, *11*(6), 1527–1545. https://doi.org/10.1007/s12671-020-01367-w

Shapiro, D. (1992). A preliminary study of long-term meditators: Goals, effects, religious orientation, cognitions. *The Journal of Transpersonal Psychology*, *24*(1), 23–39.

Shiffman, S., Stone, A. A., & Hufford, M. R. (2008). Ecological momentary assessment. *Annual Review of Clinical Psychology*, *4*(1), 1–32. https://doi.org/10.1146/annurev.clinpsy.3.022806.091415

Sirimanne, C. R. (2018). The unique perspective on intention (Cetanā), ethics, agency, and the self in Buddhism. In B. Grant, J. Drew, & H. E. Christensen (Eds.), *Research in ethical issues in organizations* (Vol. 20, pp. 31–44). Emerald Publishing Limited. https://doi.org/10.1108/S1529-209620180000020003

Stussman, B. J., Bethell, C. D., Gray, C., & Nahin, R. L. (2013). Development of the adult and child complementary medicine questionnaires fielded on the National Health Interview Survey. *BMC Complementary and Alternative Medicine*, *13*(1), 328. https://doi.org/10.1186/1472-6882-13-328

Sumantry, D., & Stewart, K. E. (2021). Meditation, mindfulness, and attention: A meta-analysis. *Mindfulness*, *12*(6), 1332–1349. https://doi.org/10.1007/s12671-021-01593-w

Sun, L.-N., Gu, J.-W., Huang, L.-J., Shang, Z.-L., Zhou, Y.-G., Wu, L.-L., Jia, Y.-P., Liu, N.-Q., & Liu, W.-Z. (2021). Military-related posttraumatic stress disorder and mindfulness meditation: A systematic review and meta-analysis. *Chinese Journal of Traumatology*, *24*(4), 221–230. https://doi.org/10.1016/j.cjtee.2021.05.003

Sun, S., Goldberg, S. B., Loucks, E. B., & Brewer, J. A. (2021). Mindfulness-based interventions among people of color: A systematic review and meta-analysis. *Psychotherapy Research*, 1–14. https://doi.org/10.1080/10503307.2021.1937369

U.S. Census Bureau. (2021, July). *U.S. Census Bureau QuickFacts: United States*. https://www.census.gov/quickfacts/fact/table/US/PST045221

Van Cappellen, P., Catalino, L. I., & Fredrickson, B. L. (2020). A new micro-intervention to increase the enjoyment and continued practice of meditation. *Emotion*, *20*(8), 1332–1343. https://doi.org/10.1037/emo0000684

www.prolific.co. (2021, October 20). *Representative samples FAQ*. Prolific. https://researcher-help.prolific.co/hc/en-gb/articles/360019238413-Representative-Samples-FAQ

Zhang, Q., Wang, Z., Wang, X., Liu, L., Zhang, J., & Zhou, R. (2019). The effects of different stages of mindfulness meditation training on emotion regulation. *Frontiers in Human Neuroscience*, *13*, 208. https://doi.org/10.3389/fnhum.2019.00208

Table 1

Full and follow-up survey sample demographics

		Full Sample (*n* = 953)	Follow-Up Survey Sample (*n* = 434)
Variables		**Mean / Median / % (SD / n)**	**Mean / Median / % (SD / n)**
Age	Mean (SD)	44.69 (16.08)	43.77 (15.53)
	Median	44.00	42.00
Income	Mean (SD)	$53,762.05 (52150.67)	$54,389.56 (60126.77)
	Median	$40,000.00	$40,000.00
	Low % (n)	41.66 (397)	43.09 (187)
	High % (n)	58.34 (556)	56.91 (247)
	$50k or less % (n)	59.92 (571)	61.06 (265)
	$50-100k % (n)	28.54 (272)	29.03 (126)
	$100-150k % (n)	7.24 (69)	4.84 (21)
	$150k+ % (n)	4.30 (41)	5.07 (22)
Race/Ethnicity	White % (n)	70.62 (673)	72.58 (315)
	Black % (n)	12.80 (122)	11.98 (52)
	Hispanic % (n)	5.98 (57)	5.30 (23)
	Asian % (n)	6.93 (66)	6.68 (29)
	Native % (n)	0.42 (4)	0.46 (2)
	Multiracial % (n)	3.25 (31)	3.00 (13)
Gender	Female % (n)	50.47 (481)	54.61 (237)
	Male % (n)	48.27 (460)	43.55 (189)
	Non-binary gender % (n)	1.26 (12)	1.84 (8)
Transgender	No % (n)	99.37 (947)	98.62 (428)
	Yes % (n)	0.63 (6)	1.38 (6)
College	No % (n)	49.42 (471)	43.09 (187)
	Yes % (n)	50.58 (482)	56.91 (247)

Lifetime meditation hours	0-10 % (n)	18.89 (82)
	11-100 % (n)	41.24 (179)
	101-500 % (n)	16.36 (71)
	501-1000 % (n)	8.99 (39)
	1001-5000 % (n)	7.14 (31)
	5001+ % (n)	7.37 (32)
Any meditation in the past 30 days	Yes % (n)	65.21 (283)
Weekly days of meditation in the past 30 days	Mean (SD)	2.2.1 (2.38)

Note. Low / high income = below or above the US median household income; White = non-Hispanic White; College = bachelor's degree or higher.

Table 2

Initial and Current Motivation for Meditation

	Full Sample (n = 434)	Current Meditators (n = 283)					
Motivation	**Initial** Mean (SD)	**Initial** Mean (SD)	**Current** Mean (SD)	**%Change**	**McNemar's χ^2**	$p_{\text{FDR adjusted}}$	p_{raw}
Awakening	0.15 (0.35)	0.19 (0.39)	0.25 (0.43)	0.06	7.36	.008**	.006
Cultural	0.12 (0.32)	0.12 (0.33)	0.12 (0.33)	0.00	0.04	.847	.847
Mental Health	0.74 (0.44)	0.76 (0.43)	0.89 (0.32)	0.13	20.90	<.001***	<.001***
Physical Health	0.16 (0.37)	0.17 (0.38)	0.37 (0.48)	0.19	39.29	<.001***	<.001***
Spiritual	0.28 (0.45)	0.32 (0.47)	0.43 (0.50)	0.11	13.83	<.001***	<.001***
Other	0.08 (0.27)	0.04 (0.19)	0.04 (0.19)	0.00	0.00	.999	.999

Note. *<.05,**<.01,***<.001; FDR = false discovery rate.

Table 3

Correlations Between Demographic Variables and Motivation for Meditation

	Initial motivation (n = 434)					Current motivation (n = 283)				
Demographic variables	**Awakening**	**Cultural**	**Mental health**	**Physical health**	**Spiritual**	**Awakening**	**Cultural**	**Mental health**	**Physical health**	**Spiritual**
Age	.03	.09	-.28***	-.01	.08	.01	.08	-.14	.10	.12
Male gender	.08	-.03	-.01	-.01	-.09	.08	.01	.02	.01	-.05
NH White	-.06	-.14*	-.09	.01	-.06	-.06	-.09	-.01	.02	-.03
Black	.11	.03	.09	.00	.08	.13	.14	.01	.00	.09
Latinx	.01	.01	.05	.03	-.02	.02	-.05	.00	.01	.01
Asian	-.03	.13*	-.03	-.04	.00	-.02	.03	.01	-.06	-.04
Multiracial	-.06	.05	.01	.03	0.05	-.05	.00	.06	.00	-.06
College	-.02	-.03	-.08	.00	0.07	-.01	.00	-.03	.09	.06
Low Income	.03	.04	.05	.05	-0.04	-.01	-.01	.14	-.02	-.12

Note. * $p<.05$,** $p<.01$,*** $p<.001$; FDR adjustment was applied to the correlation table; NH White = non-Hispanic White.

Table 4

Association between Current and Lifetime Meditation Practice with Motivations for Meditation

		Practice in the last 30 days (β)	$p_{\text{FDR adjusted}}$	p_{raw}	**Lifetime Hours (OR)[a]**	$p_{\text{FDR adjusted}}$	p_{raw}
Initial motivation	Awakening	.076	.249	.204	2.350**	.006	.004
	Cultural	.069	.259	.259	2.191*	.017	.016
	Mental health	-.205**	.003	<.001	0.495**	.006	.003
	Physical health	.072	.249	.225	1.952**	.017	.017
	Spiritual	.135*	.034	.024	2.135**	.005	.001
Current motivation	Awakening	.210**	.002	<.001	2.148**	.016	.013
	Cultural	.168**	.009	.005	6.356**	.001	<.001
	Mental health	-.140*	.031	.019	0.739	.468	.468
	Physical health	.175**	.008	.003	2.632**	.001	<.001
	Spiritual	.282***	<.001	<.001	2.535**	.001	<.001

Note. * <.05,**<.01,***<.001; β = standardized Beta; OR = Odds Ratio; Results are presented standardized regression betas while controlling for demographic variables: age, gender, race/ethnicity, income and college education; FDR adjusted = False Discovery Rate adjusted. [a] Full sample (current and non-current meditators) was utilized when examining the association between lifetime hours and initial motivation. The sample of current meditators was used for all other analyses.

Table 5

Results from Logistic Regression Examining the Association between Initial Motivations and Current Meditator Status

Motivation	**OR**	***p***
Awakening	2.933**	.002
Cultural	1.191	.586
Mental Health	1.300	.247
Physical Health	1.372	.271
Spiritual	1.835*	.011

Note. *<.05,**<.01,***<.001; OR = Odds Ratio