

Article

# Prayer, Meditation, and Anxiety: Durkheim Revisited

John P. Bartkowski \*, Gabriel A. Acevedo  and Harriet Van Loggerenberg

Department of Sociology, The University of Texas at San Antonio, One UTSA Circle, San Antonio, TX 78249, USA; gabriel.acevedo@utsa.edu (G.A.A.); vanloggh@gmail.com (H.V.L.)

\* Correspondence: john.bartkowski@utsa.edu; Tel.: +1-210-508-2530

Received: 31 July 2017; Accepted: 8 September 2017; Published: 14 September 2017

**Abstract:** Durkheim argued that religion’s emphasis on the supernatural combined with its unique ability to foster strong collective bonds lent it power to confer distinctive social benefits. Subsequent research has confirmed these propositions with respect to religion and mental health. At the same time, meditation has been linked to mental health benefits in intervention-based studies. Our investigation offers a unique test of two comparable inhibitors of anxiety-related symptoms in the general population, namely, prayer versus meditation. Using data from the 2010 wave of the Baylor Religion Survey, we find that frequent communal prayer is correlated with an increased incidence of anxiety-related symptoms whereas worship service attendance is negatively associated with reported anxiety. Attendance also combines with communal prayer to yield anxiety-reducing benefits. Meditation, measured as a dichotomous indicator, is unrelated to reported anxiety in our sample of American adults. Our study underscores the selective efficacy of collective forms of religious expression, and points to several promising directions for future research.

**Keywords:** religion; prayer; meditation; anxiety; mental health

---

## 1. Introduction

For several decades now, social scientists have recognized the mental health benefits associated with religiosity (see [Bonelli and Koenig 2013](#); [Koenig 1993, 2009, 2015](#); [Moreira-Almeida et al. 2006](#); [Schieman et al. 2013](#); [Unterrainer et al. 2014](#) for reviews). Religion’s positive association with robust mental health is, in one sense, explainable by the role of religious beliefs in providing comfort, particularly in times of distress ([Moreira-Almeida et al. 2006](#)). Yet, beliefs alone do not constitute religion. Religious beliefs are given efficacy through congregationally based networks that collectively reinforce values and serve as critical conduits of social support. Religious networks cultivated through attendance at worship services, prayer groups, and scripture study fellowships can also serve as a structural vehicle for the dissemination of essential coping strategies ([Krause et al. 2001](#)). Such coping strategies may entail guidance on the nature, tenor, and substance of prayer, among other aspects of religious life. Consequently, formal religious participation has been shown to have different effects on mental health than spiritual perceptions, and important distinctions have been drawn between religion and spirituality ([Ellison and Fan 2008](#); [Greenfield et al. 2009](#); see [Hill and Pargament 2008](#)). Nevertheless, congregational involvement and collective worship have consistently been shown to serve as vital mental health assets.

Emile Durkheim, one of the founders of sociology as a scientific discipline, would have expected that religion could serve as a social platform for robust mental health. [Durkheim \(1915\)](#) argued that religion plays a unique role in societies such that it provides a morally grounded belief system rooted in the supernatural (belief in God, an afterlife, and other-worldly phenomena) reinforced by especially strong this-worldly collective bonds (social solidarity among like-minded believers). Moreover, Durkheim’s work suggests that religious devotion, particularly when performed collectively, can produce an especially strong sense of togetherness among fellow worshippers. Durkheim rather

famously dubbed this form of religious experience “collective effervescence.” Our study takes several cues from a Durkheimian perspective while examining the relative anxiety-reducing efficacy of religious involvement and, specifically, prayer versus its secular counterpart, namely, meditation. Meditation in Western societies is a principally secular, therapeutic, and often individualistic pursuit that is quite distinct from its historical roots in Buddhism (Stratton 2015; West 2016). Consequently, this particular practice, as conducted in the West, provides us with an opportunity to draw intriguing contrasts between behaviors that are remarkably similar in their desired outcome (peace and comfort) but that utilize very different avenues for pursuing such ends (religious versus secular means).

We begin by reviewing research on anxiety, as well as the mental health benefits of prayer and meditation. Anxiety-related symptoms are quite worthy of scholarly investigation. Anxiety is prevalent in the contemporary U.S. This condition exacts severe emotional tolls and significant financial costs. Our review of relevant research indicates that various aspects of religion, including prayer and worship service attendance, have been associated with lower levels of anxiety. At the same time, intervention-based randomized controlled trials suggest that meditation can bring about reduced anxiety. These findings set up an intriguing comparison of the anxiety-reduction benefits associated with prayer versus meditation. We use key elements of Durkheimian theory to guide our investigation, and hypothesize that involvement in activities of religious groups—especially communal (group) prayer and worship service attendance—will be associated with lower levels of anxiety-related mental health deficits, while individual prayer and meditation will yield no such benefits. We draw on data from the 2010 wave of the Baylor Religion Survey to examine this issue empirically. We develop an omnibus measure of anxiety-related symptomology, and this construct exhibits excellent internal reliability. After delineating our findings, we conclude by summarizing our results and discussing the implications of our study.

## 2. Empirical Background

Anxiety-related disorders and conditions loom large in American society. The American Psychiatric Association’s *DSM-IV-TR* (2000) includes a host of conditions that range from generalized anxiety to specific forms of situational panic, fear, worry, and dread (NIMH 2016; Thorson 1998). Data from the National Institute of Mental Health indicate that anxiety and anxiety-related mental health adversities are a serious health problem in the U.S. Experts have estimated that at least 40 million American adults between the ages of 18 and 54 suffer from anxiety disorders or related problems (Kessler et al. 2005a, 2005b; Wang Philip S. et al. 2005). The average age of onset for anxiety is quite young, with signs first appearing at eleven years old (Kessler et al. 2005a). A study commissioned by the Anxiety and Depression Association of America (ADAA) indicates that anxiety costs the U.S. more than \$42 billion per year, which amounts to about one-third of the cost of all mental health conditions combined (Greenberg et al. 1999).

Religion and mental health, broadly defined, have been extensively studied, and a good deal of attention has been paid to the role of prayer in facilitating mental health (Ellison et al. 2014). Simply put, prayer can function as a proxy for greater dedication to one’s faith (McCullough 1995), can serve as a source of meaning, purpose, and coping in a religious person’s life (Ellison 1991; Ellison and Taylor 1996), and may have stress-reducing effects on a psychological level or through the minimization of exposure to deleterious social situations (Levin 2004). Quite notably, prayer can enhance bonds with coreligionists, thereby having an indirect influence on positive forms of mental health (Koenig et al. 1997). Consequently, several studies reveal significant linkages between the frequency of prayer and positive forms of mental health, including life satisfaction (Ai et al. 2002, 2007; Musick et al. 1998) and psychological well-being (Maltby et al. 1999) (Ellison et al. 2014 for review). Still, this research is not unequivocal. In fact, rival bodies of scholarship have emerged. One stream of research has indicated a persistently null association between prayer and mental health (Ellison 1991; Ellison et al. 2009; Schieman et al. 2006), while another has linked prayer to adverse mental health conditions (Bradshaw et al. 2008; Ellison 1995; Ellison et al. 2001) (Ellison et al. 2014).

These mixed results have been evident in cross-sectional investigations and longitudinal studies, with some suspicion and evidence that types (styles) of prayer (e.g., scripted versus unscripted), contexts of prayer (e.g., high-anxiety versus low-anxiety situations), and expectancies about prayer (e.g., beliefs about whether or not prayers can be answered) may account for these variegated findings (Belding et al. 2010; Ellison et al. 2014; Harris et al. 2005; Wiegand 2004). There is some evidence that coordinated communal prayers are especially efficacious in inhibiting depression and anxiety, with such effects being evident in both short-term and long-term time periods (Boelens et al. 2009, 2012).

A relatively small body of previous research has explored the linkages between religion and anxiety as a specific mental health condition. Some early research examined the correlation between religion and a particular form of anxiety, namely, death anxiety, but these studies did not produce conclusive evidence of an association between these factors (e.g., Alvarado et al. 1995; see Shreve-Neiger and Edelstein 2004; Thorson 1998). Research on religion and general forms of anxiety paint a somewhat complicated picture and are marked by methodological limitations (Shreve-Neiger and Edelstein 2004). Among a small sample of women ( $N = 32$ ) in one early study, religiosity was inversely associated with anxiety and distress (Atkinson and Maloney 1994). Other research has focused on possible denominational differences in religion and anxiety, and revealed that Pentecostals exhibited significantly elevated six-month and lifetime rates of anxiety while mainline Protestants had significantly lower rates (Koenig et al. 1994). However, there is some evidence that such associations are influenced by social support (Koenig et al. 1993a) as well as socioeconomic status and health-related factors (e.g., chronic illness, functional ability) (Koenig et al. 1993b). Distinctions have also been drawn between extrinsic religiousness (e.g., worship service attendance, social involvement in congregational activities), intrinsic religiousness (e.g., religious feelings and sentiments), and anxiety. Some evidence indicates that extrinsic religiousness, but not intrinsic religiousness, is associated with heightened anxiety (Park et al. 1990). However, anxiety is more commonly manifested through social encounters that, in fact, constitute extrinsic forms of religiousness (e.g., involvement in faith community activities). Hence, it may be that social involvement rather than extrinsic religiousness per se generates greater anxiety (Thorson 1998).

Previous studies have been hampered by data and sampling limitations noted above. Many of these limitations were eclipsed by two studies that, in our view, are the most fruitful investigations of religion and anxiety conducted to date (Ellison et al. 2009, 2014). Both of these studies used data drawn from nationally representative probability samples to examine the association between religious factors and anxiety. Using General Social Survey data, the first of these investigations (Ellison et al. 2009) revealed that more frequent worship service attendance and belief in an afterlife were associated with reduced anxiety when narrowly defined by a four-item index to include feelings of anxiousness, tenseness, fearfulness, and worry. The authors created an index of anxiety that indicated how often during the past seven days respondents reported experiencing such feelings. This index, which ranged on a scale from one to seven days, produced an internal reliability measure of 0.66. These same religious factors were also associated with higher levels of tranquility. However, a key variable of interest in our study—namely, prayer—exhibited no direct association with either anxiety or tranquility, with the latter conceived as the obverse of anxiety indicated by feelings of ease, contentment, and calm. Interestingly, prayer had an indirect association with anxiety by buffering the adverse influence of compromised health and financial strain on anxiety.

In a follow-up study, Ellison and colleagues (Ellison et al. 2014) offered a more detailed investigation of the relationship between prayer, attachment to God, and anxiety using data from the 2010 Baylor Religion Survey. This study revealed the complexity of these interconnections. In this study, the frequency of prayer exhibited no significant association with symptoms of anxiety. However, an anxious attachment to God was positively linked to symptoms of anxiety while its opposite—a secure attachment to God—was associated with reduced anxiety. More complex statistical modeling further revealed prayer to exhibit a negative association with anxiety, but only among individuals who reported having a secure attachment to God. For those with an insecure or avoidant attachment to God, prayer

was positively associated with anxiety. In short, while prayer did not exhibit a direct association with anxiety-related symptoms, such linkages were moderated by a respondents' relationship with God.

Considerable research has surfaced on meditation as a practice used in the U.S. and, more broadly, the West. Meditation is typically pursued in Western nations as a secular practice oriented around contemplation and mindfulness (Stratton 2015). With its largely secular, therapeutic, and pragmatic focus, Western meditation is quite different from that associated with traditional Buddhism and Eastern mysticism (West 2016). As practiced in the West, meditation is a broad set of practices that can be categorized as a complementary approach to health, and can include yoga (the most popular modality with many variants), tai chi, and qi gong (Clarke et al. 2015). One recent systematic review and meta-analysis of 47 trials with over 3500 participants (Goyal et al. 2014) uncovered a positive association between meditation and mental health, with significant anxiety reduction eight weeks and three to six months after program completion. This particular meta-analysis focused on rigorously conducted randomized controlled trials with active control groups to discern placebo effects. While meditation did foster anxiety reduction, its effects were not evident for positive mood, attention, substance use, eating habits, sleep, or weight management. Other studies and meta-analyses have demonstrated that various types of meditation can be an effective therapy for anxiety (Krisanaprakornkit et al. 2006; Toneatto and Nguyen 2007) and that some types of people (e.g., those capable of autonomous relaxation) might especially benefit from meditation-based anxiety reduction (Delmonte 1985). Several studies have indicated that mindfulness-based interventions, a cognitive approach to meditation that focuses on the acceptance of present moment experiences, can counter anxiety and other adverse conditions (Hoge et al. 2013; see Gu et al. 2015 for review). Mindfulness-based interventions have also been used effectively to manage everyday anxiety and panic (Evans et al. 2008; Peterson and Pbert 1992) as well as improve performance in workplace settings (Gordon et al. 2014). Some studies have uncovered brain activity patterns that may be responsible for the anxiety-reducing benefits of meditation (Zeidan et al. 2014).

There are important data limitations associated with research on meditation. First, studies of meditation often involve small numbers of subjects, thereby raising questions about the statistical power of such inquiries. Second, although many randomized controlled trials of meditation have been conducted, we are not aware of any research on meditation and mental health in the general population. Randomized controlled trials are excellent for determining the relative effectiveness of an intervention for those among a randomly assigned population, typically compared against a wait-list control group. However, intervention-based sampling for a randomized controlled trial is not commensurate with national probability sampling drawn randomly from the American population. Third, meditation in the population at large is likely to be practiced quite differently than intervention-based meditations. Americans at large who meditate may be inclined to do so in an ad hoc, unsupervised, and solitary fashion. With these considerations in mind, our study introduces an intriguing point of comparison with meditation by examining its association with mental health relative to that of prayer frequency. While prayer and meditation are not identical practices, they are sufficiently similar counterparts with shared objectives so as to invite comparisons about their relative associations with mental health and, more specifically, anxiety-related distress.

### 3. Theory and Hypotheses

Our study uses a Durkheimian approach to investigate the links between religious involvement, meditation, and mental health. Durkheim (1915, 1951, 1973) recognized the centrality of religion to the formation and maintenance of social bonds among people and the well-being of individuals within society. For Durkheim (1973), the most profound social bonds have a moral locus, which is to say that such relations are rooted in shared values and dispositions. Moreover, religion is the consummate social form through which these values are transmitted to members of any given society (Durkheim 1915). Religious rites such as prayer and worship are, therefore, social and moral in their effects on people who engage in them. Thus, in *Elementary Forms*, Durkheim (1915, p. 427) argues that

the moral forces expressed by religious symbols are real forces with which we must reckon . . . The representations which [a religious rite] seeks to awaken and maintain in our minds are not vain images which correspond to nothing in reality . . . They are as necessary for the well working of our moral life as our food is for the maintenance of our physical life, for it is through them that the group affirms and maintains itself, and we know the point to which this is indispensable for the individual . . . So a rite is something different from a game; it is a part of the serious life . . . It has its share in the feeling of comfort which the worshipper draws from the rite performed; for recreation [re-creation] is one of the forms of the moral remaking which is the principal object of the positive rite.

To extend this point, Durkheim (1915, pp. 427–28) then proceeds to compare group-based religious activities (ritual ceremonies) with their secular counterparts (festivals or games), arguing that the former is a moral endeavor while the latter is a more frivolous affair. Religious rites aim toward re-creation, that is, the moral remaking of persons and society, while festivals or games are purely recreational.

We might extend Durkheim's reasoning to argue that religious activities such as prayer and worship enlist supernatural resources to pursue "moral remaking" when compared with secular activities such as meditation. This is not to say that meditation has a frivolous, game-like quality. In fact, research reviewed above indicates that regular meditation as a structured intervention is often associated with anxiety reduction. However, meditation in the West typically serves rather practical, even utilitarian, ends inasmuch as it is designed to assist in stress management and performance improvement. Moreover, there is no clear indication that meditation in the West is practiced as a corporate activity in group-based settings akin to prayer circles or congregational worship. (The sole exception might be school-based or workplace meditation interventions, yet these still often entail individual meditative practice.) Thus, while the "moral stakes" are greater in a religious activity than its secular counterpart, those moral stakes are further heightened through corporate devotion and worship. Durkheim (1915, p. 250) has argued that religious devotion performed in a group setting can be especially powerful, even giving rise to "collective effervescence," that is, feelings of unity and transcendence by which the individual feels subsumed into the group.

We therefore propose the following hypotheses net of confounding factors. Hypotheses 1–3 and Hypothesis 5 focus on the associations between religious factors and anxiety-related symptoms, while Hypothesis 4 focuses on meditation. Our first and fourth hypotheses anticipate null associations for individual activities, religious (personal prayer) (H1) and secular (meditation) (H4), with respect to anxiety. By contrast, our second and third hypotheses expect inverse associations between corporate religious involvement—communal prayer (H2) and worship service attendance (H3)—and anxiety-related symptoms.

**Hypothesis 1.** *Frequency of personal prayer will not be significantly associated with anxiety-related psychological distress.*

**Hypothesis 2.** *Frequency of communal prayer will exhibit a significant inverse association with anxiety-related psychological distress.*

**Hypothesis 3.** *Frequency of worship service attendance will exhibit a significant inverse association with anxiety-related psychological distress.*

**Hypothesis 4.** *Meditation will not be significantly associated with anxiety-related psychological distress.*

**Hypothesis 5.** *Given the centrality of collective religious bonds to mental health, the association between communal prayer and anxiety-related psychological distress will be moderated by frequency of worship service attendance.*



## 4. Methods

### 4.1. Data

We analyze data from the most recent wave of the Baylor Religion Survey (BRS), a national probability sample of U.S. adults. The third wave of data collection for this cross-sectional survey was completed in November of 2010 by the Gallup Organization. A mixed-mode sampling design of telephone and self-administered mailed surveys was used in all three waves of the BRS (2005, 2007, and 2010, respectively), resulting in a study sample size of 1713.

### 4.2. Dependent Variable and Focal Independent Variables

The BRS includes a battery of questionnaire items that measure the occurrence of various dimensions of anxiety-related symptoms. The response categories for all items are based on ordinal categories as follows: (0) never, (1) rarely, (2) sometimes, (3) often, and (4) very often. For our study, we create a 15-item mean index of past-month symptoms of anxiety (Cronbach's  $\alpha = 0.92$ ). We take the average score so that a greater number indicates higher levels of anxiety-related symptomology. Appendix A features the specific wording and mnemonics for each item included in the index.

Our focal predictors include individual prayer, communal prayer, religious service attendance, and meditation. Individual prayer is assessed by asking, "How often do you spend time alone praying outside of religious services?" Response categories were (0) never, (1) only on certain occasions, (2) once a week or less, (3) a few times a week, (4) once a day, and (5) several times a day. Communal prayer is measured by asking, "How often did you participate in the following religious or faith-based activities in the last month? Community prayer group or Bible study." Response categories are (0) not at all, (1) one to two times, (2) three to four times, and (3) five or more times. While this question combines prayer group and Bible study participation, Bible studies often serve as a forum for communal prayer (opening and closing the study session with prayer that is focused on group members' concerns). Our indicator of religious service attendance asks, "How often do you attend religious services at a place of worship?" with possible responses including (0) never, (1) less than once a year, (2) once or twice a year, (3) several times a year, (4) once a month, (5) two to three times a month, (6) about weekly, (7) weekly, and (8) several times a week. Meditation is measured by asking, "Do you practice meditation?" with possible responses dummy coded so that (0) no (reference category) is compared with (1) yes.

### 4.3. Control Variables

Our model estimates also include controls for denominational affiliation, which is dummy coded such that (0) evangelical Protestant (reference category) is compared with (1) mainline Protestant, Catholic, other, or none. Lastly, our models include controls for standard socioeconomic and demographic variables that could potentially confound the associations between prayer, meditative practice, and anxiety. We collapse the detailed measures of racial/ethnic identity provided by BRS into one dummy coded variable where (0) White (reference category) is compared with (1) Black, Hispanic, or other. Gender and marital status are both entered into equations as dummy coded variables where, (0) male (reference category) is contrasted with (1) female and (0) unmarried (reference category) is distinguished from (1) married. Age is measured in actual years. Two indicators of SES are included in our models. Educational attainment is dummy coded with (0) some college or less (reference category) contrasted to (1) college graduate, or postgraduate. We control for income by including a seven-category ordinal measure of household earnings before taxes ranging from (1) \$10,000 or less through (7) \$150,001 or more.

### 4.4. Analytical Strategy

The original anxiety index was positively skewed and leptokurtic. Consequently, the original index violated assumptions of Ordinary Least Squares (OLS) regression (i.e., homoscedasticity and

normality of residuals). We conducted a square root transformation of the anxiety index based on results from Tukey's ladder of powers test (Stata's "ladder" command). This action brought skewness and kurtosis levels within normal range and allowed for unbiased OLS estimates. Our final models report unstandardized coefficients from OLS regression models. Missing data for our study were handled using multiple imputation, with five imputations of the original data. These techniques are consistent with current conventions in social scientific research.

## 5. Results

Before we turn to results of multivariate models, a few noteworthy characteristics from descriptive data are worth mentioning. First, as shown in Table 1, levels of anxiety-related psychological distress are relatively moderate. The range for anxiety featured in Table 1 is 0–2 (not 0–4, as originally featured in the survey response options) because of the square root transformation performed on the data. And as noted above, the Cronbach's alpha coefficient of reliability reaches a level above 0.90 ( $\alpha = 0.92$ ) and gives us confidence that the fifteen individual indicators capture an underlying construct of anxiety-related symptomology.

**Table 1.** Descriptive Statistics ( $n = 1713$ ).

	Range	Mean (%)	SD	$\alpha$
Dependent Variable				
Anxiety	0–2	0.82	0.39	0.92
Meditation, Prayer, and Attendance				
Meditation (yes/no)	0–1	(27)		
Individual prayer	0–5	3.01	1.83	
Communal prayer	1–4	1.35	0.78	
Religious attendance	0–8	3.90	2.97	
Denominational Affiliation				
Evangelical Protestant (reference)	0–1	(30)		
Mainline Protestant	0–1	(25)		
Catholic	0–1	(24)		
Other	0–1	(11)		
None	0–1	(10)		
Controls				
Age	18–108	55.87	16.25	
Female	0–1	(54)		
Male (reference)	0–1	(46)		
White (reference)	0–1	(74)		
Black	0–1	(9)		
Hispanic	0–1	(6)		
Other	0–1	(11)		
Married	0–1	(63)		
Not married (reference)	0–1	(37)		
Some college or less (reference)	0–1	(62)		
College graduate	0–1	(19)		
Post-graduate	0–1	(19)		
Household income	1–7	4.31	1.63	

Next, we see that over one-quarter of the sample (27%) engages in some form of meditation based on a dichotomous (yes/no) outcome, while mean scores for individual prayer indicate that it is a relatively prevalent practice. As might be expected, communal prayer is less common than individual prayer. There are also several prominent descriptive features of the data. These include an older population sample, and one characterized by high levels of representation from women (54%), married persons (63%), and lower educated respondents (62%). With these key features of descriptive data in mind, we now turn to results of multivariate models.

Table 2 displays model estimates from OLS regressions with the dependent variable consisting of anxiety-related symptomology over the past thirty days. Model 1 examines the associations between our dependent variable and individual prayer net of controls. In successive models, we then examine the respective associations of anxiety-related symptomology and communal prayer (Model 2), religious attendance (Model 3), and meditation (Model 4). Model 5 is the full model absent of any interaction terms, while Model 6 introduces an interaction term between communal prayer and attendance.

Our first hypothesis predicts no significant association between individual prayer and levels of anxiety-related symptomology. Model 1 reveals that individual prayer is significantly associated with lower levels of anxiety-related symptomology. This association, however, does not remain significant in the full model (Model 5). Overall, then, there is partial support for H1. H2 anticipated an inverse association between communal prayer and self-reported anxiety symptoms. No such association is observed in Model 2. However, a significant association surfaces in both Models 5 and 6, such that increased participation in communal prayer is actually associated with higher levels of anxiety. This positive association between communal prayer and anxiety is the opposite of that which was hypothesized. Therefore, no support is found for H2.<sup>1</sup> H3 expected a significant inverse relationship between religious attendance and anxiety symptoms. Strong support is observed for H3, with highly significant associations exhibited across all models ( $p < 0.001$ ). Consistent with H4, there are no significant associations between meditation and anxiety-related symptoms observed in any models.

We now investigate the empirical expectations of H5. Recall that H5 predicted the presence of a moderating effect between communal prayer and worship service attendance when explaining the occurrence of anxiety-related symptomology. Here, we turn to both results of OLS regression shown in Model 6 of Table 2 and the graphical representation shown as Figure 1. Model 6 in Table 2 indicates that, consistent with the expectations of H5, religious attendance moderates the association between communal prayer and anxiety-related symptoms. The negative interaction term (communal prayer  $\times$  attendance) suggests that communal prayer has an inverse association with anxiety, but only for those who attend worship services regularly. As shown by Figure 1, those who frequently attend religious services (one standard deviation above the attendance mean) exhibit lower levels of anxiety with increasing involvement in communal prayer. Therefore, H5 is supported.

We close with a brief discussion of noteworthy effects of control variables on anxiety-related symptomology. Starting with religious controls, denominational affiliation has little association with our dependent variable. The sole exception to this general pattern is observed for religious nones (unaffiliated) who report significantly lower incidence of anxiety when compared to evangelical Protestants. Results also indicate a pronounced association, across all models, from marital status, with married individuals showing lower levels of self-reported anxiety symptoms when compared to unmarried persons. Finally, education and income both exhibit significant negative associations with anxiety, net of statistical controls, across all model estimates. Realizing our main interest is in empirically assessing the merits of key hypothesized associations, we limit our discussion of control variables to these central points and move to a discussion that highlights the explanatory and theoretical implications of our key results.

---

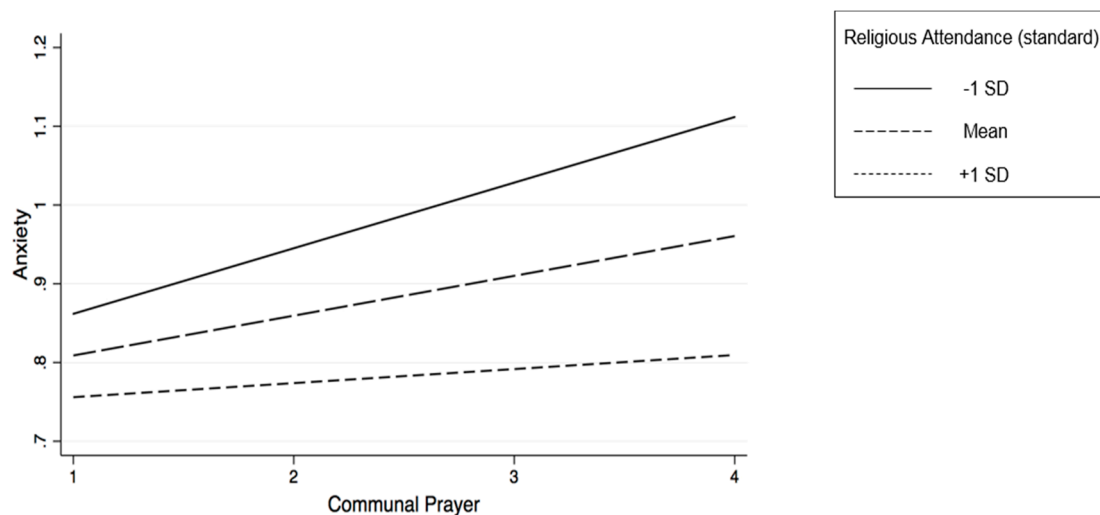
<sup>1</sup> Tests of variance inflation factors (VIFs) indicate the absence of multicollinearity in Model 5, with VIF scores for all variables below 2.



**Table 2.** OLS Regression Models Estimating Past-Month Symptoms of Anxiety (*n* = 1713).

	(1)	(2)	(3)	(4)	(5)	(6)
Religious Engagement						
Individual prayer	−0.012	*			−0.004	−0.005
Communal prayer		0.007			0.026	0.051
Religious attendance			−0.015	***	−0.020	−0.022
Meditation				−0.001	0.007	0.009
Communal prayer x attendance						−0.011
Denominational Affiliation						
Mainline Protestant	0.012	0.016	0.012	0.016	0.012	0.012
Catholic	−0.006	−0.003	−0.008	−0.003	−0.009	−0.009
Other	−0.011	−0.006	−0.014	−0.006	−0.015	−0.018
None	−0.090	*	−0.054	**	−0.055	−0.107
Controls						
Age	−0.002	**	−0.002	**	−0.002	**
Female	0.023		0.015		0.018	0.016
Black	−0.003		−0.014		−0.012	−0.013
Hispanic	−0.005		−0.003		−0.003	−0.005
Other	0.011		0.008		0.008	0.002
Married	−0.070	**	−0.073	**	−0.072	**
College graduate	−0.112	***	−0.112	***	−0.112	***
Post-graduate	−0.080	**	−0.078	**	−0.079	**
Household income	−0.030	***	−0.028	***	−0.029	***
Intercept	1.161		1.112		1.124	1.099
R <sup>2</sup>	0.066		0.064		0.078	0.080

Notes: \* *p* < 0.05; \*\* *p* < 0.01; \*\*\* *p* < 0.001 (two-tailed).



**Figure 1.** Communal Prayer x Religious Attendance on Symptoms of Anxiety.

## 6. Discussion and Conclusions

This study aimed to augment existing scholarship on religious involvement and psychological distress with a focus on anxiety-related symptoms evident in a nationally representative sample of American adults. One key contribution of this study entailed examining the potentially protective influences of prayer versus meditation on anxiety-related psychological distress. Following theoretical tenets initially set forth by Emile Durkheim, we hypothesized that integration in religious networks, as measured through communal prayer and worship service attendance, would reduce anxiety-related symptoms. Individual prayer and meditation, both of which are typically undertaken as private pursuits, were not expected to yield such benefits.

Our hypotheses received mixed support. Individual prayer initially exhibited a modest negative association with anxiety, but that association was attenuated with the addition of religious controls. Contrary to expectations, frequent communal prayer was associated with elevated symptoms of anxiety. This finding may indicate that more frequently experienced anxiety symptoms lead people to seek out religious support through communal prayer. Using cross-sectional data in this study leaves us unable to address questions of causal order. We are also unable to determine the long-term efficacy of communal prayer for anxiety. It is possible that, over time, communal prayer encounters could yield mental health benefits that are not evident in a cross-sectional inquiry such as our own. Future studies could examine the causal effects of communal prayer on anxiety using longitudinal data with a panel of study participants. In addition, our communal prayer measure is somewhat compromised, as it captures participation in Bible studies or prayer groups. These forms of religious participation are not identical, thereby inviting some questions about the validity of this item.

Consistent with expectations grounded in previous research and Durkheimian theory, we discovered that more frequent worship service attendance was associated with diminished anxiety symptoms. This study, then, adds to a long line of research inquiries that have documented the mental health benefits of integration in religious networks oriented toward supernatural phenomena. Such benefits may be linked to adherents' experiences at worship services and, quite likely, the social support provided by relationships with coreligionists. Finally, we hypothesized that worship service attendance would moderate the association between communal prayer and symptoms of anxiety. This hypothesis was supported, such that worship service attendance significantly reduced the direct positive relationship between communal prayer and anxiety-related psychological distress. This finding indicates that respondents who participate in both worship services and communal prayer groups receive the greatest mental health benefits of these dual forms of religious network integration.

The key takeaway from these findings is clear. In our study, worship service attendance is the religious linchpin of salutary psychological well-being. In this sense, worship service attendance could function as an ontoformative practice. Ontoformative practices are those that create social realities (Connell 2011). These realities are discernible and may be measurable, although the processes that give rise to them—perhaps linked to experiences of collective effervescence—may be best suited for qualitative investigation (e.g., congregational fieldwork, in-depth or focus group interviews). Worship service attendance seems to yield mental health benefits in a way that other religious beliefs and practices do not. This finding should not be interpreted as a “prescription” of congregational involvement and worship service participation for positive mental health. Rather, such forms of social support might also be achieved through involvement in other groups, such as professional associations, community groups, etc. That being said, there may be some unique influences linked to integration within a group that aims to produce encounters with supernatural phenomena that are simply not replicated in secular associations (Acevedo et al. 2014).

It is noteworthy that we found no protective associations between meditative practice and reduced risks of reporting anxiety-related symptoms. As practiced in the West, meditation is not oriented toward the supernatural but rather is focused on achieving stress relief and, quite often, mindfulness. It is possible that no significant protective associations were observed for meditation because of its more utilitarian aims. However, our study leaves many questions about meditation unanswered. We could not determine how frequently respondents meditated because of our dichotomous measure, nor did we examine the type of meditation used (e.g., mindfulness versus others) or the social context for this practice (individual versus group meditation). Given previous research on the mental health benefits of group-based structured meditation programs, our study is more of a preliminary comparison between meditation and prayer with respect to mental health. Future research is clearly needed to examine the frequency, types, and contexts of meditation in the general population. Moreover, it is possible that survey questions about meditation may be interpreted quite differently by distinct groups of respondents. Some respondents might conflate prayer and meditation, both of which provide quiet time for reflection. However, other respondents may draw sharp distinctions between them, whether in the form of Eastern meditation versus Western prayer or secular versus religious practices. These are questions best addressed by future research. Until such studies are conducted, we find considerable evidence of the protective role of religious participation—particularly, worship service attendance—in lowering the risk of reported anxiety symptoms.

**Acknowledgments:** This study was not funded. The authors are grateful for reviewer comments on an earlier draft of this paper.

**Conflicts of Interest:** The authors declare no conflict of interest.

## Appendix A

---

### Questionnaire Items Included in BRS Anxiety Index (Cronbach's $\alpha = 0.92$ )

---

- (Q33A) Over the past month, how often have you felt nervous, anxious, or on edge?
  - (Q33B) Over the past month, how often have you thought too much about pointless matters?
  - (Q33C) Over the past month, how often have you been afraid something terrible would happen if you did not perform certain rituals?
  - (Q33D) Over the past month, how often have you felt that it is not safe to trust anyone?
  - (Q33E) Over the past month, how often have you not been able to stop or control worrying?
  - (Q33F) Over the past month, how often have you felt compelled to perform certain actions, for no justifiable reason?
  - (Q33G) Over the past month, how often have you become anxious doing things because people were watching?
  - (Q33H) Over the past month, how often have you been plagued by thoughts or images that you cannot get out of your mind?
  - (Q33I) Over the past month, how often have you repeated simple actions that realistically did not need to be repeated?
  - (Q33J) Over the past month, how often have you thought too much about things that would not bother other people?
  - (Q33K) Over the past month, how often have you feared that you might do something to embarrass yourself in a social situation?
  - (Q33L) Over the past month, how often have you endured intense anxiety in social or performance situations?
  - (Q33M) Over the past month, how often have you felt that people were taking advantage of you?
  - (Q33N) Over the past month, how often have you worried too much about different things?
  - (Q33O) Over the past month, how often have you felt like you were being watched or talked about by others?
-

## References

- Acevedo, Gabriel A., Christopher G. Ellison, and Xiaohe Xu. 2014. Is it really religion? Comparing the main and stress-buffering effects of religious and secular civic engagement on psychological distress. *Society and Mental Health* 4: 111–28. [[CrossRef](#)]
- Ai, Amy L., Christopher Peterson, Steven F. Bolling, and Harold G. Koenig. 2002. Private prayer and the optimism of middle-aged and older patients awaiting cardiac surgery. *The Gerontologist* 42: 70–81. [[CrossRef](#)] [[PubMed](#)]
- Ai, Amy L., Christopher Peterson, Terrence N. Tice, Bu Huang, Willard Rogers, and Steven F. Bolling. 2007. The influence of prayer coping on mental health among cardiac surgery patients. *Journal of Health Psychology* 12: 580–96. [[CrossRef](#)] [[PubMed](#)]
- Alvarado, Katherine A., Donald I. Templer, Charles Bresler, and Shan Thomas-Dobson. 1995. The relationship of religious variables to death depression and death anxiety. *Journal of Clinical Psychology* 51: 202–4. [[CrossRef](#)]
- Atkinson, Bruce E., and H. Newton Maloney. 1994. Religious maturity and psychological distress among older Christian women. *International Journal for the Psychology of Religion* 4: 165–79. [[CrossRef](#)]
- Belding, Jennifer N., Malcolm G. Howard, Anne M. McGuire, Amanda C. Schwartz, and Janie H. Wilson. 2010. Social buffering by God: Prayer and measures of stress. *Journal of Religion and Health* 49: 179–87. [[CrossRef](#)] [[PubMed](#)]
- Boelens, Peter A., Roy R. Reeves, William H. Replogle, and Harold G. Koenig. 2009. A randomized trial of the effect of prayer on depression and anxiety. *The International Journal of Psychiatry in Medicine* 39: 377–92. [[CrossRef](#)] [[PubMed](#)]
- Boelens, Peter A., Roy R. Reeves, William H. Replogle, and Harold G. Koenig. 2012. The effect of prayer on depression and anxiety: Maintenance of positive influence one year after prayer intervention. *The International Journal of Psychiatry in Medicine* 43: 85–98. [[CrossRef](#)] [[PubMed](#)]
- Bonelli, Raphael M., and Harold G. Koenig. 2013. Mental disorders, religion, and spirituality 1990 to 2010: A systematic evidence-based review. *Journal of Religion and Health* 52: 657–73. [[CrossRef](#)] [[PubMed](#)]
- Bradshaw, Matt, Christopher G. Ellison, and Kevin J. Flannelly. 2008. Prayer, God imagery, and symptoms of psychopathology. *Journal for the Scientific Study of Religion* 47: 644–59. [[CrossRef](#)]
- Clarke, Tainya C., Lindsey I. Black, Barbara J. Stussman, Patricia M. Barnes, and Richard L. Nahin. 2015. *Trends in the Use of Complementary Health Approaches among Adults: United States, 2002–2012*. National Health Statistics Report, no. 79; Hyattsville: National Center for Health Statistics.
- Connell, Raewyn. 2011. Southern Bodies and disability: Re-thinking concepts. *Third World Quarterly* 32: 1369–81. [[CrossRef](#)]
- Delmonte, Michael M. 1985. Meditation and anxiety reduction: A literature review. *Clinical Psychology Review* 5: 91–102. [[CrossRef](#)]
- Diagnostic and Statistical Manual of Mental Disorders (Text Revision) (DSM-IV-TR). 2000. Washington: American Psychiatric Association.
- Durkheim, Emile. 1915. *The Elementary Forms of the Religious Life*. New York: The Free Press.
- Durkheim, Emile. 1951. *Suicide: A Study in Sociology*. New York: The Free Press.
- Durkheim, Emile. 1973. *On Morality and Society*. Edited and with an introduction by Robert N. Bellah; Chicago: University of Chicago Press.
- Ellison, Christopher G. 1991. Religious involvement and subjective well-being. *Journal of Health and Social Behavior* 32: 80–99. [[CrossRef](#)] [[PubMed](#)]
- Ellison, Christopher G. 1995. Race, religious involvement, and depressive symptomatology in a Southeastern U.S. community. *Social Science and Medicine* 40: 1561–72. [[CrossRef](#)]
- Ellison, Christopher G., and Daisy Fan. 2008. Daily spiritual experiences and psychological well-being among US adults. *Social Indicators Research* 88: 247–71. [[CrossRef](#)]
- Ellison, Christopher G., and Robert J. Taylor. 1996. Turning to prayer: Social and situational antecedents of religious coping among African American adults. *Review of Religious Research* 38: 111–31. [[CrossRef](#)]
- Ellison, Christopher G., Jason D. Boardman, David R. Williams, and James S. Jackson. 2001. Religious involvement, stress, and mental health: Findings from the 1995 Detroit Area Study. *Social Forces* 80: 215–49. [[CrossRef](#)]
- Ellison, Christopher G., Amy M. Burdette, and Terrence D. Hill. 2009. Blessed assurance: Religion, anxiety, and tranquility among U.S. adults. *Social Science Research* 38: 656–67. [[CrossRef](#)] [[PubMed](#)]

- Ellison, Christopher G., Matt Bradshaw, Kevin J. Flannelly, and Kathleen C. Galek. 2014. Prayer, attachment to God, and symptoms of anxiety-related disorders among U.S. adults. *Sociology of Religion* 75: 208–33. [[CrossRef](#)]
- Evans, Susan, Stephen Ferrando, Marianne Findler, Charles Stowell, Colette Smart, and Dean Haglin. 2008. Mindfulness-based cognitive therapy for generalized anxiety disorder. *Journal of Anxiety Disorders* 22: 716–21. [[CrossRef](#)] [[PubMed](#)]
- Gordon, William Van, Edo Shonin, Masood Zangeneh, and Mark D. Griffiths. 2014. Work-related mental health and job performance: Can mindfulness help? *International Journal of Mental Health and Addiction* 12: 129–37. [[CrossRef](#)]
- Goyal, Madhav, Sonal Singh, and Erica M. S. Sabinga. 2014. Meditation programs for psychological stress and well-being: A systematic review and meta-analysis. *JAMA Internal Medicine* 174: 357–68. [[CrossRef](#)] [[PubMed](#)]
- Greenberg, Paul E., Tamar Sisitsky, Ronald G. Kessler, and A. J. Fyer. 1999. The economic burden of anxiety in the 1990s. *Journal of Clinical Psychiatry* 60: 427–35. [[CrossRef](#)] [[PubMed](#)]
- Greenfield, Emily A., George E. Vaillant, and Nadine F. Marks. 2009. Do formal religious participation and spiritual perceptions have independent linkages with diverse dimensions of psychological well-being? *Journal of Health and Social Behavior* 50: 196–212. [[CrossRef](#)] [[PubMed](#)]
- Gu, Jenny, Clara Strauss, Rod Bond, and Kate Cavanagh. 2015. How do mindfulness-based cognitive therapy and mindfulness-based stress reduction improve mental health and wellbeing? A systematic review and meta-analysis of mediation studies. *Clinical Psychology Review* 37: 1–12. [[CrossRef](#)] [[PubMed](#)]
- Harris, J. Irene, Sean W. Schoneman, and Stephanie R. Carrera. 2005. Preferred prayer styles and anxiety control. *Journal of Religion and Health* 44: 403–12. [[CrossRef](#)]
- Hill, Peter C., and Kenneth I. Pargament. 2008. Advances in the conceptualization and measurement of religion and spirituality: Implications for physical and mental health research. *American Psychologist* 58: 64–74. [[CrossRef](#)]
- Hoge, Elizabeth A., Eric Bui, Luana Marques, Christina A. Metcalf, Laura K. Morris, Donald J. Robinaugh, John J. Worthington, Mark H. Pollack, and Naomi M. Simon. 2013. Randomized controlled trial of Mindfulness Meditation for generalized anxiety disorder: Effects on anxiety and stress reactivity. *Journal of Clinical Psychiatry* 74: 786–92. [[CrossRef](#)] [[PubMed](#)]
- Kessler, Ronald C., Wai Tat Chiu, Olga Demler, and Ellen E. Walters. 2005a. Prevalence, severity, and comorbidity of twelve-month DSM-IV disorders in the National Comorbidity Survey Replication. *Archives of General Psychiatry* 62: 617–27. [[CrossRef](#)] [[PubMed](#)]
- Kessler, Ronald C., Patricia Berglund, Olga Demler, Robert Jin, Kathleen R. Merikangas, and Ellen E. Walters. 2005b. Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the National Comorbidity Survey Replication. *Archives of General Psychiatry* 62: 593–602. [[CrossRef](#)] [[PubMed](#)]
- Koenig, Harold G. 1993. The relationship between Judeo-Christian religion and mental health among middle-aged and older adults. *Advances* 9: 33–39.
- Koenig, Harold G. 2009. Research on religion, spirituality, and mental health: A review. *The Canadian Journal of Psychiatry* 54: 283–91. [[CrossRef](#)] [[PubMed](#)]
- Koenig, Harold G. 2015. Religion, spirituality, and health: A review and update. *Advances in Mind-Body Medicine* 29: 19–26. [[PubMed](#)]
- Koenig, Harold G., Stephen M. Ford, Linda K. George, Dan G. Blazer, and Keith G. Meador. 1993a. Religion and anxiety disorder: An examination and comparison of associations in young, middle-aged, and elderly adults. *Journal of Anxiety Disorders* 7: 321–42. [[CrossRef](#)]
- Koenig, Harold G., Linda K. George, Judith C. Hays, David B. Larson, Harvey J. Cohen, and Dan G. Blazer. 1993b. The relationship between religion and anxiety in a sample of community-dwelling older adults. *Journal of Geriatric Psychiatry* 26: 65–93.
- Koenig, Harold G., Linda K. George, Dan G. Blazer, Keith G. Meador, and Peter B. Dyck. 1994. Religious affiliation and psychiatric disorder among Protestant Baby Boomers. *Psychiatric Services* 45: 586–96. [[CrossRef](#)]
- Koenig, Harold G., Judith C. Hays, Linda K. George, Dan G. Blazer, David B. Larson, and Lawrence R. Landerman. 1997. Modeling the cross-sectional relationships between religion, physical health, social support, and depressive symptoms. *American Journal of Geriatric Psychiatry* 5: 131–44. [[CrossRef](#)] [[PubMed](#)]



- Krause, Neal, Christopher G. Ellison, Benjamin A. Shaw, John P. Marcum, and Jason D. Boardman. 2001. Church-based social support and religious coping. *Journal for the Scientific Study of Religion* 40: 637–56. [CrossRef]
- Krisanaprakornkit, Thawatchai, Wimonrat Sriraj, Nawanant Piyavhatkul, and Malinee Laopaiboon. 2006. Meditation therapy for anxiety disorders. *Cochrane Database of Systematic Reviews*. [CrossRef]
- Levin, Jeffrey S. 2004. Prayer, love, and transcendence: An epidemiologic perspective. In *Religious Influences on Health and Well-Being in the Elderly*. Edited by K. Warner Schaie, Neal Krause and Alan Booth. New York: Springer, pp. 69–95.
- Maltby, John, Christopher Alan Lewis, and Liza Day. 1999. Religious orientation and psychological well-being: The role of the frequency of personal prayer. *British Journal of Health Psychology* 4: 363–78. [CrossRef]
- McCullough, Michael E. 1995. Prayer and health: Conceptual issues, research review, and research agenda. *Journal of Psychology and Theology* 23: 15–29.
- Moreira-Almeida, Alexander, Francisco Lotufo Neto, and Harold G. Koenig. 2006. Religiousness and mental health: A review. *Revista brasileira de psiquiatria* 28: 242–50.
- Musick, Marc A., Harold G. Koenig, Judith C. Hays, and Harvey J. Cohen. 1998. Religious activity and depression among community-dwelling elderly persons with cancer: The moderating effect of race. *Journal of Gerontology: Social Sciences* 53B: S218–S227. [CrossRef]
- NIMH (National Institute of Mental Health). 2016. Anxiety disorders. Available online: <https://www.nimh.nih.gov/health/topics/anxiety-disorders/index.shtml> (accessed on 30 May 2017).
- Park, Crystal L., Lawrence H. Cohen, and Lisa Herb. 1990. Intrinsic religiousness and religious coping as life stress moderators for Catholics versus Protestants. *Journal of Personality and Social Psychology* 59: 562–74. [CrossRef] [PubMed]
- Peterson, Linda Gay, and Lori Pbert. 1992. Effectiveness of a meditation-based stress reduction program in the treatment of anxiety disorders. *American Journal of Psychiatry* 149: 936–43.
- Schieman, Scott, Tetyana Pudrovska, Leonard I. Pearlin, and Christopher G. Ellison. 2006. The sense of divine control and mental health: Variations by race and socioeconomic status. *Journal for the Scientific Study of Religion* 45: 529–49. [CrossRef]
- Schieman, Scott, Alex Bierman, and Christopher G. Ellison. 2013. Religion and mental health. In *Handbook of the Sociology of Mental Health*. New York: Springer, pp. 457–78.
- Shreve-Neiger, Andrea K., and Barry A. Edelstein. 2004. Religion and anxiety: A critical review of the literature. *Clinical Psychology Review* 24: 379–97. [CrossRef] [PubMed]
- Stratton, Stephen P. 2015. Mindfulness and contemplation: Secular and religious traditions in Western context. *Counseling and Values* 60: 100–18. [CrossRef]
- Thorson, James A. 1998. Religion and anxiety: Which anxiety? Which religion? In *Handbook of Religion and Mental Health*. Edited by Harold G. Koenig. San Diego: Academic Press, pp. 147–60.
- Toneatto, Tony, and Linda Nguyen. 2007. Does mindfulness meditation improve anxiety and mood symptoms? A review of the controlled research. *The Canadian Journal of Psychiatry* 52: 260–66. [CrossRef] [PubMed]
- Unterrainer, Human-Friedrich, Andrew J. Lewis, and Andreas Fink. 2014. Religious/spiritual well-being, personality and mental health: A review of results and conceptual issues. *Journal of Religion and Health* 53: 382–92. [CrossRef] [PubMed]
- Wang Philip S., Michael Lane, Mark Olsson, Harold A. Pincus, Kenneth B. Wells, and Ronald C. Kessler. 2005. Twelve month use of mental health services in the United States. *Archives of General Psychiatry* 62: 629–40. [CrossRef] [PubMed]
- Michael A. West, ed. 2016. *The Psychology of Meditation: Research and Practice*. New York: Oxford University Press.
- Wiegand, Katherine Elizabeth Kurek. 2004. The Effects of Prayer on Anxiety and Performance. Ph.D. dissertation, Purdue University, West Lafayette, IN, USA.
- Zeidan, Fadel, Katherine T. Martucci, Robert A. Kraft, John G. McHaffie, and Robert C. Coghill. 2014. Neural correlates of mindfulness meditation-related anxiety relief. *Social Cognitive and Affective Neuroscience* 9: 751–59. [CrossRef] [PubMed]

