

## Perceived Barriers to Meditation Among College Students: The Role of Personality Traits

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### ABSTRACT

**Background:** Meditation is likely to be a useful intervention for anxiety and depression, and is increasingly common as a clinical intervention and informal practice among university students. However, meditation dropout rates are high, and it is likely that perceived barriers to meditation play a role. While neuroticism is known to predict dropout, there has been no study relating personality traits to these barriers.

**Aim:** To better understand the barriers to meditation practice that university students experience.

**Methods:** We used online survey data to analyze the relationship between personality traits, whether students practice meditation, time spent on academic and other work, and university students' perception of barriers to meditation.

**Results:** We found a nonlinear relationship between neuroticism and perceived barriers; the number of perceived barriers increased with increased neuroticism but eventually flattened out. Participants who meditate perceive more barriers than those who do not. We found no relationship between time spent in other activities and perception of barriers.

**Conclusions:** Those students who would benefit most from meditation may have the most trouble continuing. Clinicians applying meditation as an intervention in a university setting should be ready to work with students on barriers to practice.

Submitted 4 January 2019; accepted 28 February 2019

*Keywords:* meditation, barriers to meditation, neuroticism, mindfulness, university students

Meditation includes a wide variety of techniques for bringing attention to the breath, cognition, the body, a repeated word, or one's own stream of consciousness, with the goal of altering cognition and emotion (Dahl, Lutz, & Davidson, 2015). Studies indicate that meditation can help reduce a person's depressive symptoms and relapse into depression (Cavanagh, Strauss, Forder, & Jones, 2014; Eisendrath, Chartier, & McLane, 2010; Peit, 2011; Kenny & Williams, 2005; Klainin-Yobas, Cho, & Creedy, 2011; Manicavasgar, Parker, & Perich, 2010). Meditation is known to reduce stress and anxiety (Cavanagh et al., 2014; Sharma & Rush 2014; Vollestad, Nielsen, & Nielsen; 2011), and there is evidence that meditation improves hypochondria, which involves both stress and anxiety regarding health (Suraway, McMannus, Muse, & Williams, 2014). Meditation is also known to help insomnia (Winbush, Gross, & Kreitzer, 2007). There is also evidence that meditation may improve attention and memory (Sharma, 2015).

Anxiety and depression are the two most common mental health issues reported by college students (Center for Collegiate Mental Health, 2017) and so it is not surprising that meditation has seen increasing application with this



population. In a meta-analysis of 25 studies of mindfulness meditation given to college students as treatment for anxiety, Bamber and Morpeth (2018) found a moderate to large effect size in most studies. There is exploratory evidence that mindfulness meditation improves the general sense of well-being of college students (Crowley & Munk, 2016).

While meditation appears to benefit individuals with affective disorders, program compliance and retention are problematic. In a study of mindfulness-based self-help interventions, Cavanagh, Strauss, Forder, and Jones (2014) found that on average, across studies, 73% of participants completed meditation interventions, but that attrition rates could be as high as 52%. In a meta-analysis of mindfulness based treatments of anxiety disorders, Vollestad, Nielsen, and Nielsen (2012) found attrition rates in individual studies as high as 45%. In a study of loving-kindness meditation (LKM), Frederickson, Cohn et al. (2008) reported a rate of attrition due to noncompliance of 28%. In a study of LKM as a treatment for back pain, Carson, et al. (2005) reported an attrition rate of 42%. It is worth noting that nearly all intervention studies are short term, and that in the case of meditation, a skill that is intended to be practiced for years, any attrition figure is likely to be underestimated.

In an attempt to understand one possible source of program noncompliance, Berghoff, Wheeless, Ritzert, Wooley, and Forsyth (2017) assigned students to either ten minutes or twenty minutes of mindfulness meditation per day for two weeks. They found no statistically significant difference in compliance between the two groups. As they noted, however, programs such as Mindfulness Based Stress Reduction (MBSR) often involve considerably longer daily periods of practice, so it is possible that differences in compliance would appear if a third group were assigned to longer periods of meditation. Further, the time frame of the experiment was short—it is possible that differences in adherence would have appeared after a month or two.

Neuroticism is a personality trait that is known to be correlated with the presence of mood disorders such as anxiety and depression (Paulus, Vanwoerden, Norton, & Sharp, 2016; Newby et al., 2017), for which meditation is frequently used as a clinical treatment (Cavanagh et al., 2014; Eisendrath et al., 2010; Peit, 2011; Kenny & Williams, 2005; Klainin-Yobas et al., 2011; Manicavasgar et al., 2010). It has long been noted that neuroticism predicts compliance in studies of meditation. Delmonte (1980) found that neuroticism was negatively correlated with frequency of meditation practice. In a later, prospective study, Delmonte (1988) found that neuroticism predicted short-term compliance with a meditation schedule. More recently, Dobkin, Irving and Amar (2012) cite a number of studies suggesting that individuals with more volatile personalities may be at increased risk of attrition in studies of mindfulness based interventions, which typically occurs in the early stages. Thus, while there is evidence that long term practice of meditation can reduce neuroticism (Crescentini & Capurso, 2015; Leung & Singhal, 2004; Van Den Hurk et al., 2011), neuroticism appears to incline subjects toward lower levels of compliance in the early stages. In the absence of longitudinal studies, it is also possible that the common finding of lower levels of neuroticism in senior meditators partly represents a tendency of more neurotic meditators to drop out.

Why would someone who is high in neuroticism be less likely to comply with a meditation protocol, the long term effect of which would be to lower neuroticism? One possibility is that individuals who are higher in neuroticism perceive more barriers to meditation. Using a sample of 150 family caregivers of cancer patients, Williams, Van Ness, Dixon and McCorkle (2011) found that neuroticism was positively correlated with perceived barriers to meditation. No one has at this point replicated this finding with university students. Given the increased use of meditation in the clinical treatment of students, such a replication is justified.

## METHODS

This study was approved by a University Institutional Review Board prior to any data collection. All participants were currently enrolled in university level course work. A convenience sample of participants was recruited from a Midwestern university with a total enrollment of 59,482 through a series of emails sent from the university's Office of Student Life and College of Social Work. The emails were circulated to students at both graduate and undergraduate levels. Participants who consented to be part of the study were directed to a Qualtrics page where they could take the electronic survey. A five dollar Amazon gift card was given as an incentive for taking the survey.

Personality type was measured using the Big Five Inventory (BFI; John, Donahue & Kentle, 1991). The BFI is a 44-item scale measuring extraversion, agreeableness, conscientiousness, neuroticism, and openness. Cronbach's alpha reliability of the BFI subscales ranges from  $\alpha = .75$  to  $.90$ , with a mean of over  $.80$  and test-retest reliability over three months ranging from  $r = .18$  -  $.90$ . The BFI has also shown convergent validity with peer ratings of personality and other measures of Big Five personality traits (John & Srivastava, 1999). Median test-retest reliability of the BFI has varied from  $r = .66$  -  $.78$  in different studies of university students (Gnambs, 2016).

Participants' perceptions of barriers to meditation were measured using the 17-question Determinants of Meditation Practice Inventory (DMPI; Williams et al., 2011). The DMPI has a Cronbach's alpha of  $\alpha = .87$  and a test-retest intraclass correlation coefficient of  $r = .86$  (CI =  $.82$ -. $90$ ). In addition to these two instruments, respondents were asked whether they meditated at all, if so the type of meditation they practiced, the highest degree they had completed, the number of hours they spent on work and school per week and their gender.

Analysis proceeded in two stages. In the first stage, a local regression curve was fit to a scatterplot of neuroticism as a predictor of barriers to meditation as a check for nonlinearity in the relationship. Local regression (LOESS) fits a weighted least squares regression function to a scatterplot within a moving window. It therefore allows the detection of nonlinear structure in scatterplots (Cleveland, 1979). For instance, if participants' perception of barriers to meditation rose rapidly at low levels of neuroticism but then flattened out, LOESS would produce a plot that showed this. The LOESS curve was fit using SAS Studio 3.5 (SAS Institute 2016), using a locally linear fit and a smoothing parameter of  $.6$ . Following this visual analysis, a Generalized Additive Model (GAM) was fit to the dataset. GAM allows regression using a scatterplot smoother, yielding a model using multiple predictors that is robust to departures from regression linearity assumptions (Hastie & Tibshirani, 1986). The GAM was fit using the R package gam (Hastie, 2018). Alpha was set at  $.05$ , but probabilities are also reported.

## RESULTS

Eighty-four percent of participants were female, while sixteen percent were male. Seventy percent of participants reported they had completed some college, with 15% having an associate degree, 10% a bachelor's degree, and 5% a master's degree. A plurality of participants, 37%, reported that they spent 11 - 20 hours per week completing school work and extracurricular activities, with 33% reporting 21 - 30 hours, 12% 31 - 40 hours, 10% 40 hours or more, and 8% 0 - 10 hours. Forty-three percent of respondents worked 0 - 10 hours at paid employment, 27% worked 11 - 20 hours, 13% worked 21 - 30 hours, 7% worked 31 - 40 hours, and 10% worked 40 or more hours. Sixty nine percent of respondents reported practicing meditation while 31% reported not practicing. Of those who practiced meditation, 82% reported practicing mindfulness meditation, 12% concentration meditation, 33% physical meditation such as

T'ai chi or yoga, and 16% some other form of meditation. Thus, a considerable percentage of those who did meditate practiced more than one form of meditation.

In this administration, Cronbach's alpha was  $\alpha = .830$  for the DMPI,  $\alpha = .827$  for the BFI neuroticism subscale,  $\alpha = .883$  for the BFI extraversion subscale,  $\alpha = .726$  for the BFI agreeableness subscale,  $\alpha = .787$  for the BFI conscientiousness subscale and  $\alpha = .775$  for the BFI openness to experience subscale. Descriptive statistics for these variables can be found in Table 1.

**Table 1**

**Descriptive Statistics for Determinants of Meditation Practice Inventory and Big Five Inventory Subscales**

<u>Variable</u>	<u>Minimum</u>	<u>Maximum</u>	<u>Mean</u>	<u>Std. Deviation</u>
Determinants of Meditation Practice Inventory	16.00	64.00	39.1839	9.51196
Big Five Inventory Extraversion	10.00	40.00	25.6471	7.31715
Big Five Inventory Agreeableness	23.00	45.00	34.4048	5.19527
Big Five Inventory Conscientiousness	15.00	43.00	31.1412	6.00823
Big Five Inventory Neuroticism	13.00	39.00	26.6471	6.00735
Big Five Inventory Openness	18.00	47.00	37.3095	5.95156

Figure 1 shows the LOESS curve fit of the BFI neuroticism subscale as a predictor of perceived barriers to meditation as measured by the DMPI. The relationship is nonlinear. Estimated DMPI score shows a gradual exponential increase from 32 at a BFI neuroticism score of 16 to a peak of 45 at a BFI neuroticism score of 33, after which the relationship flattens out.

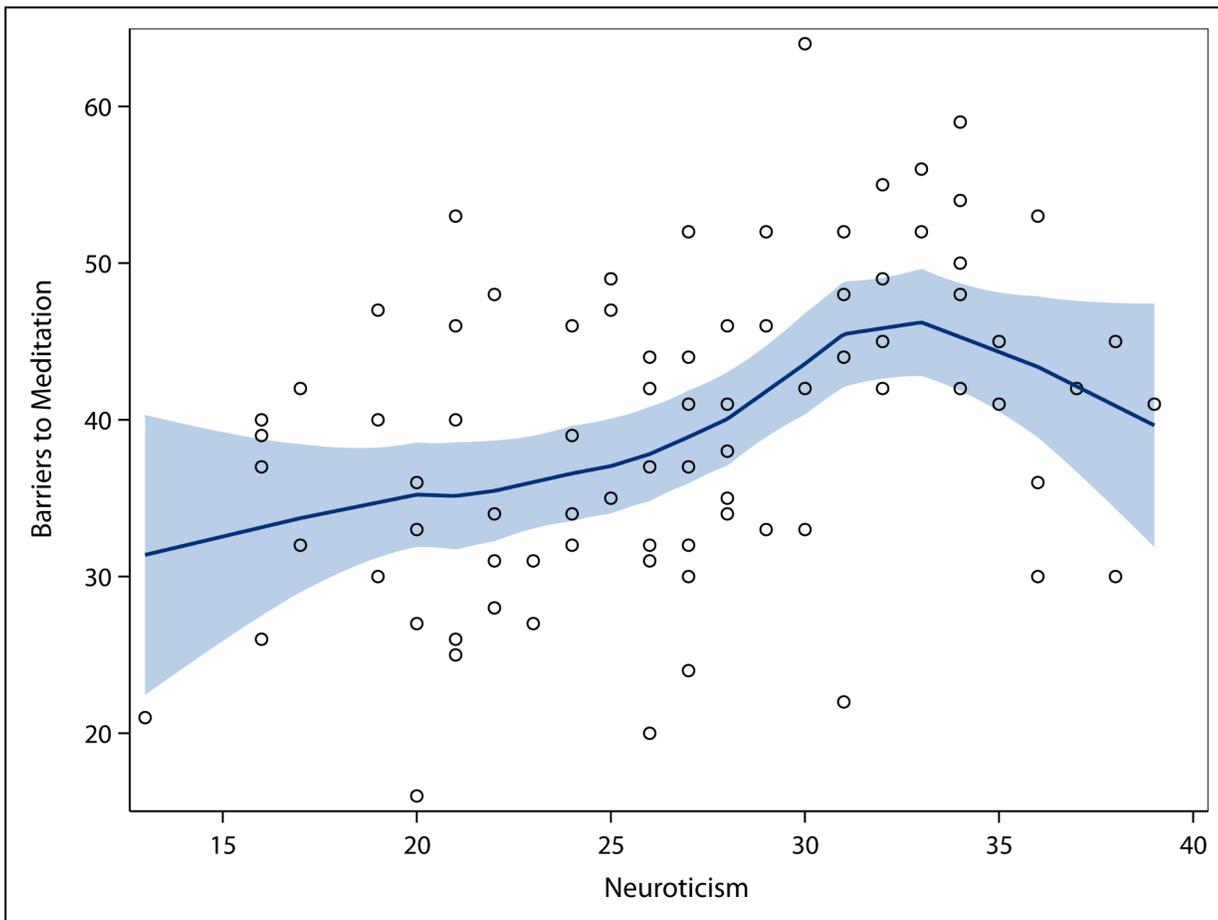


Figure 1. LOESS regression curve of neuroticism as a predictor of barriers to meditation, degree = 1, smoothing parameter = .6, 95% CI.

### GAM MODEL

Ninety-three participants began the survey. Six of those provided no data on either the DMPI or the BFI. Missing data on individual questions meant that an additional eight participants were excluded from the final GAM analysis due to listwise deletion of cases (Allison, 2001). The results of that analysis can be found in Table 2.

**Table 2****Results of the Generalized Additive Model, Using the Determinants of Meditation Practice Inventory as the Dependent Variable**

<u>Variable</u>	<u>Sum Sq.</u>	<u>F Value</u>	<u>P Value</u>
Neuroticism	1333.4	20.7325	>0.001
Extraversion	46.9	0.7289	0.39618
Agreeableness	29.9	0.4650	0.49759
Conscientiousness	16.0	0.2492	0.61920
Openness	22.7	0.3531	0.55432
Practice Meditation	1284.9	19.9782	>0.001
Gender	148.7	2.3117	0.13298
Hours At School	245.8	3.8216	0.05465
Hours At Work	37.8	0.5870	0.44619

Among the Big Five personality traits, Neuroticism was a statistically significant predictor of DMPI (Sum Sq. = 1333.4,  $F$  value = 20.735,  $p$  value < .001), but this was not true of Extraversion, Agreeableness, Conscientiousness or Openness. Whether people practiced meditation was a statistically significant predictor of DMPI (Sum Sq. = 1284.9,  $F$  value = 19.978,  $p$  value < .001). Gender was not statistically significant, nor were hours spent at either school or work.

Following this initial model, nonsignificant variables were removed from the model sequentially in order to test for relationships that may have been suppressed due to collinearity. In particular, it seemed possible that hours spent at school might be a statistically significant predictor of DMPI if hours spent at work were removed from the model. But this was not the case. Elimination of hours spent at work led to no significant change in the parameter values associated with hours spent at school. Successive backward elimination of all variables other than neuroticism and the practice of meditation failed to yield any changes in statistical significance.

## DISCUSSION

The analysis in this study found that both neuroticism and whether a student meditates predicted students' perception of barriers to meditation (Sum Sq. = 1333.4,  $F$  = 20.735,  $p$  < .001 and Sum Sq. = 1284.9,  $F$  = 19.978,  $p$  < .001, respectively). Neuroticism had a nonlinear relationship to that perception, first rising and then flattening out. No other personality traits were correlated with perceived barriers to meditation. However, the scores on conscientiousness and openness to experience were high, as might be expected for a sample of university students, and there may not have been enough variability in these variables to establish a relationship. Gender did not correlate with perceived barriers to meditation. Neither hours at school nor hours at work correlated with perceived barriers.

This study is clearly exploratory, consisting of a small convenience survey of university students. Since it is correlated with mood disorders, neuroticism is both an important variable itself, one of the Big Five personality traits (John & Srivastava, 1999) and a valuable proxy measure for the presence of anxiety and depression. It seems likely that a personality trait such as neuroticism precedes an individual's perception of barriers to meditation, and it seems

unlikely that perceived barriers to meditation would impel students to meditate. This reasoning suggests that the independent variables of statistical significance temporally precede the dependent variable.

The finding that neuroticism predicts perceived barriers to meditation offers an explanation for previous evidence that neuroticism predicts noncompliance with meditation (Delmonte, 1980; Delmonte, 1988; Dobkin et al., 2012). Since neuroticism has frequently been found to correlate with the presence of mood disorders (Paulus et al., 2016; Newby et al., 2017), the most common reason for referral to university counseling services (Center for Collegiate Mental Health, 2017), this raises an obvious difficulty with meditation as a treatment for these conditions. Those clients who need the intervention most are likely to perceive more barriers to doing it.

It may seem paradoxical that those students who practiced meditation would perceive more barriers to the practice, but commentary on this point goes back for at least 1,500 years. Both classic meditation manuals such as the *Visuddhimagga* (Buddhaghosa, 2003) and contemporary meditation manuals such as *Mindfulness: A Practical Guide to Awakening* (Goldstein, 2016) emphasize what Buddhist scriptures discuss as hindrances to meditation, such as restlessness or doubting the benefits of practice. A number of DMPI items, such as being unable to stop thoughts or not thinking that meditation can help one, directly echo these hindrances. In many cases, an individual is unlikely to notice these until he or she has begun practice, just as someone who does not exercise regularly is unlikely to understand the full difficulty involved.

University counselors who are using meditation as an intervention should be prepared to discuss barriers to meditation with their clients, and potentially to measure them with the DMPI. They should also monitor clients who are working on meditative interventions, both as part of the process of discussing barriers and to make sure that clients are actually meditating. While many meditative interventions are delivered in psychoeducational formats, it should be possible to take some time each week to discuss progress and barriers. Finally, alternative interventions such as cognitive behavioral therapy should be made available.

Researchers who are analyzing the relationship between neuroticism and barriers to meditation should be aware that linear models may underestimate the strength and statistical likelihood of this relationship. Moreover, studies of the relationship between neuroticism and barriers to meditation in clinical populations may fail to detect it, since the relationship is essentially flat at the high levels of neuroticism that are likely to characterize individuals in psychotherapy, particularly for mood disorders.

## CONCLUSION

The use of meditation as a clinical intervention, particularly mindfulness meditation, has grown dramatically in the last two decades (Van Dam et al., 2018). Process research that looks at barriers to practice, reasons for attrition, teaching styles and possible negative effects, has grown more slowly. We hope that this article will encourage university counselors to look a bit more closely at the processes that students who practice meditation go through and the challenges they face.

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## **Acknowledgements**

The authors would like to acknowledge financial support from The Ohio State University College of Social Work and valuable consultation with Lauren Goodridge of the SAS Institute.