

The Relationship between the Practice of Sitting and Silent Meditation and Psychological Well-Being and the Effects of Personality Traits

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Abstract

This study investigated the relationship between the practice of meditation – number of months, weekly and daily frequencies and duration of each practice – and psychological well-being among 142 adult meditators. Personality traits were controlled for mediation effects. Data were analyzed using a hierarchical multiple linear regression model. Results indicated that the number of months and the weekly frequency were positively associated with well-being. There was an interaction between number of months and weekly frequency, suggesting that for people meditating 6/7 times a week there was no difference in the psychological well-being score for those practicing for 1 year or longer. In addition, personality traits – extraversion, neuroticism and conscientiousness – seemed to mediate the relationship observed. These findings are partly in accordance with previous studies, but also bring further insights to new investigations. *Keywords:* Meditation; Psychological well-being; Personality traits.

La Relación entre la Práctica de Meditación Sentada e Silenciosa y el Bienestar Psicológico e los Efectos de los Trazos de Personalidad

Compendio

Este estudio investigó la relación entre la práctica de meditación – número de meses, frecuencia diaria y semanal y duración de cada práctica – y el bienestar psicológico entre 142 adultos meditadores. Fueron controlados los trazos de personalidad para efectos de mediación. Los datos fueron analizados a través de un modelo de regresión jerárquica múltiple. Los resultados indicaron que lo número de meses y la frecuencia semanal fueron positivamente asociados con bienestar. Fue observada una interacción entre lo número de meses y frecuencia semanal, sugiriendo que para las personas que meditan 6/7 veces por semana no hubo diferencia en el bienestar psicológico de aquellos que practican hace un año o más. Además de eso, trazos de personalidad como extroversión, neuroticismo y apertura, fueron identificados como mediadores de esta relación. Estos resultados están parcialmente de acuerdo con estudios anteriores, pero también traen contribuciones para nuevas investigaciones. *Palabras clave:* Meditación; Bienestar psicológico; Trazos de personalidad.

Defining and measuring psychological well-being is not an easy task. A series of determinants, comprising either external conditions or internal processes, can influence this state (Davidson, 2004; Veenhoven, 1997). Besides gender, income, occupation, education and marriage (Diener, Oishi, & Lucas, 2003), empirical evidence has indicated that people's well-being is also closely related to their temperament and personality. Specifically, research has shown that well-being has a positive association with extraversion and a negative one with neuroticism, indicating a dispositional component in well-being (Gutiérrez, Jiménez, Hernández, & Puente, 2005; Hayes & Joseph, 2003; Nunes, Hutz, &

Giacomini, in press). Although less consistent, a positive relationship between well-being and agreeableness (Nunes et al., in press), conscientiousness (Hayes & Joseph, 2003) and openness to experience (Gutiérrez et al., 2005) has also been found. According to some authors, despite the influence of personality, it is possible to achieve greater happiness or to raise it lastingly (Ekman, Davidson, Ricard, & Wallace, 2005; Veenhoven, 1997). In fact, it has been demonstrated that affective styles and their respective brain structures can change throughout life, in response to both context and regulation (Davidson, Jackson, & Kalin, 2000).

One way of regulating emotion and enhancing psychological well-being that has been gaining particular interest lately is the practice of meditation (Shapiro, Schwartz, & Santerre, 2005). Although just recently scientific research has given special attention to this topic, meditation has been traditionally referred to as a tool for achieving enduring happiness and emotional/mental balance and, in this respect, has also been related

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to psychology for a long time (Ekman et al., 2005; Wallace & Shapiro, 2006; Walsh & Shapiro, 2006). According to research, the effects meditation has on well-being can be direct or indirect. It has been shown that the technique can foster healthy psychological functioning and positive emotional experiences and/or decrease psychological disturbances (Carmody & Baer, 2008).

It is believed that one of the main routes through which meditation can promote well-being is the acquaintance of a clearer perception of one's mental states. In other words, through meditation the person learns to monitor one's mental activities introspectively, becoming able to perceive the real nature of thoughts, that is, perceiving things free of projections and understanding their feelings' transient nature. As a result, the practitioner learns to free his/her mind of imbalances and afflictive tendencies, becoming more mindful (Ekman et al., 2005).

Although there is some inconsistency, several studies have shown that it is, indeed, possible to cultivate well-being and mental balance, like the philosophies that originated meditation have long proposed. It has been demonstrated that the practice of sitting meditation correlates with self-report measures of higher levels of positive mood (Shapiro et al., 2005), psychological well-being (Baer et al., 2008; Brown & Ryan, 2003; Nyklíèek & Kuijpers, 2008; Shapiro, Oman, Thoresen, Plante, & Flinders, 2008), lower levels of negative affect (Chambers, Yee Lo, & Allen, 2008), and fewer symptoms of depression (Chambers et al., 2008; Tang et al., 2007), of anxiety (Brown & Ryan, 2003; Davidson et al., 2003) and stress (Grossman, Niemannb, Schmidtc, & Walachc, 2004; Ostafin et al., 2006). These positive outcomes have also been achieved with clinical populations after interventions using meditation, such as HIV patients (Cruess, Antoni, Kumar, & Schneiderman, 2000), cancer patients (Brown & Ryan, 2003; Specca, Carlson, Goodey, & Angen, 2000), eating disorders (Kristeller & Hallett, 1999) and illness-related stress (Carmody & Baer, 2008). One study, however, did not find a significant change in psychological well-being as measured by the life satisfaction scale after an eight week meditation intervention, despite showing improvements in perceived stress and mental health (Oman, Hedberg, & Thoresen, 2006).

Although results vary, one aspect that seems to play an important role in the impact meditation can have on positive outcomes is the adherence to practice. It has been found that the amount of meditation practiced correlated with the outcomes measured, such as decreased binge eating (Kristeller & Hallett, 1999), improved psychological well-being (Brown & Ryan, 2003; Carmody & Baer, 2008; Specca et al., 2000), and lower levels of stress (Oman et al., 2006; Shapiro et al., 2008). Two studies, however, did not find this pattern. Despite

finding a decrease in psychological distress after a 10-day intensive meditation training, Ostafin et al. (2006) did not find a correlation between the daily frequency of practice and the outcome. Similarly, Nyklíèek and Kuijpers (2008) did not find a positive correlation between the adherence to the 8-week meditation program and the improved psychological well-being observed. In spite of these conflicting results and the fact that even brief meditation interventions seem to encourage better psychological functioning (Arch & Craske, 2006; Chambers et al., 2008; Ostafin et al., 2006; Tang et al., 2007), there is great evidence showing that the amount of practice and the length of expertise in technique can play a part in the benefits that meditation promotes. Investigators of long-term practitioners suggest that the prolonged mental training produces long lasting effects, such as improved attention and emotional regulation (Brefczynski-Lewis, Lutz, Schaefer, Levinson, & Davidson, 2007; Lutz, Brefczynski-Lewis, Johnstone, & Davidson, 2008; Lutz, Greischar, Rawlings, Ricard, & Davidson, 2004), and can influence trait-like characteristics (Cahn & Polich, 2006; Goleman & Schwartz, 1976; Sridevi & Krishna Rao, 1998). It is believed that the more one practices, the more increased processing efficiency one acquires, resulting in strengthened ability to inhibit dysfunctional cognitive and emotional mental processes (Brefczynski-Lewis et al., 2007).

Indeed, research has been giving support to the core mechanism believed to underlie the influence of meditation on well-being; i.e., decreased rumination and increased mindfulness (Brown & Ryan, 2003; Chambers et al., 2008; Jain et al., 2007). Moreover, there is growing evidence that enhanced mindfulness, as measured by pre-reflexive attention and awareness of the present moment, mediates the impact of meditation on measures such as well-being (Baer et al., 2008; Brown & Ryan, 2003; Nyklíèek & Kuijpers, 2008) and perceived stress (Shapiro et al., 2008). It is believed that heightened self-awareness is fundamental for the self-regulation process, and both have been associated with the practice of meditation (Brown & Ryan, 2003; Tang et al., 2007). There is one study, however, that investigated the mediating effects of mindfulness on well-being and found that the mediation model was only partial (Carmody & Baer, 2008). The authors believe there could be other important variables not included in the model that might explain the increase observed in well-being, besides enhanced mindfulness. One variable that has been widely related to well-being is personality, more specifically, positive and negative correlations with extraversion and neuroticism, respectively (Nunes et al., in press).

The aim of this study was to investigate whether the practice of meditation (independent variable) would be positively associated with psychological well-being (PWB) (dependent variable) in practitioners of silent and sitting

meditation. Meditation practice was assessed via the number of months the person had been continuously meditating, weekly and daily frequencies and duration of each practice. A possible interaction among these degrees of experience was also investigated. Because this was a cross-sectional study and because well-being has consistently been associated with personality, the relationship between meditation and PWB was controlled for a possible mediating effect of personality traits. Based on the results of previous empirical data, it was expected that the more experience the practitioner had in meditation, the more psychological well-being (see GHQ-60 below) he/she would manifest. Also, if after controlling for personality, this measure explained a significant variation of the PWB, it was expected that extraversion and neuroticism would be the main mediating factors.

Method

Participants

A total of 161 practitioners of passive meditation – sitting and silent – took part in this study. This meditation encompasses both concentrative and mindfulness. These two types have been included indiscriminately, because despite suggestions of possible distinct cognitive and neural routes, both have been related to better psychological functioning, especially psychological well-being (Shapiro et al., 2005; Tang et al., 2007). Practitioners, whose participation was voluntary, went regularly to one of the 20 meditation centers selected in the city of Porto Alegre, capital of Rio Grande do Sul, southern Brazil. Their experience varied from one to 420 months ($M=76.5$; $SD=92.4$), the frequency varied from one to seven days a week ($M=4.5$; $SD=2.3$), the daily frequency varied from once to four times a day ($M=1.2$; $SD=0.5$), and the duration of practice ranged from five to 120 minutes ($M=37.3$; $SD=21.7$). They had a mean age of 41 years ($SD=12.2$), 62.4% were female, 44.3% had a stable relationship, 69% had completed higher education, and 18.4% were receiving some kind of psychotherapy.

Instruments

Sociodemographic Questionnaire. This instrument was specifically created for the present investigation and included sociodemographic variables such as gender, age, marital status, education, socioeconomic status and psychotherapeutic treatment. Because most of the respondents did not give information on socioeconomic status, this variable had to be excluded from the analysis. The questionnaire also investigated meditation experience, including number of months, weekly and daily frequency, and duration of each practice. In order to evaluate and ensure that practitioners were indeed doing

and being able to experience passive meditation, they answered to an operational definition encompassing five statements, also included in this questionnaire: “I meditate using a technique; at some point of the process I feel my body relax; at some point I feel my mind relax; it is a state that I induce; and I use some kind of focus (anchor).” Participants were asked to rate how these statements apply to their practice through a 3-point Likert scale for each statement (0=never, 1=sometimes, 2=very often, 3=always). If participants answered “always” to all statements, they would have a total of 15 points. Participants were excluded if they did not meet the following criteria: beginners (up to 12 months of practice) should score a minimum of four points; intermediates (between 13 months and 36 months) should score at least eight points; and advanced practitioners (from 37 months onwards) should score a minimum of 10 points. These criteria were defined based on the observation of the frequency distribution of the points in each group.

General Health Questionnaire (GHQ). This instrument is a 60-item scale which assesses the mental health of non-clinical adults through a 4-point Likert scale. The general score, which is the purpose of this study, can be used as an indicator of psychological well-being (Sarriera, Schwarcz, & Câmara, 1996). The higher the score (maximum of 240), the worse the subject's psychological well-being. The GHQ-60 was originally developed by Goldberg, Rickels, Downing e Hesbacher (1976) and has been validated in Brazil by Pasquali, Gouveia, Andriola, Miranda e Ramos (1994), showing a good internal consistency with an overall coefficient alpha of 0.95. In the present study, the coefficient alpha obtained was 0.94.

Factorial Battery of the Five-Factor Model of Personality (BFP). This instrument measures personality according to the five-factor model: neuroticism, extraversion, openness to experience, agreeableness and conscientiousness. The BFP has been developed and validated by Nunes, Hutz e Nunes (2008), showing good internal consistency with coefficient alphas of 0.89; 0.84; 0.74; 0.85; 0.83, respectively. There are 126 items that should be answered according to a 7-point Likert scale, ranging from *this statement has nothing to do with me* to *this statement has everything to do with me*. In the present study, the coefficient alphas obtained for neuroticism, extraversion, openness to experience, agreeableness and conscientiousness were, respectively, 0.88; 0.81; 0.86; 0.87; 0.56.

Procedure

After the project was approved by the Ethics Committee of the Psychology Institute of the Federal University of Rio Grande do Sul, each person responsible for the meditation centers was contacted personally. Due

to time constraints, 20 centers were selected by convenience. They were either related to Yogic or Buddhist practice, where sitting and silent meditation was taught and regularly carried out. None refused to participate, having signed the Term of Agreement. Practitioners were then invited to take part in the study, individually or in group. Those willing to participate signed an Informed Consent and were given an envelope containing the three instruments – sociodemographic questionnaire, GHQ and BFP – so that they could answer them at home. The date of return of the envelopes was always scheduled when they were first delivered. When someone did not return according to the schedule, one of the research team members would go back to the center from time to time in order to collect the remaining envelopes. A total of 176 envelopes were handed out, of which 161 returned (percentage of losses of 10.05%).

Data Analyses

The dependent variable was the psychological well-being, which was determined by the general score of the GHQ. This outcome was evaluated as a continuous variable (the higher the score, the worse the psychological well-being), for which the mean and standard deviation were calculated for each category of independent variables. For the adjusted analyses a hierarchical multiple linear regression was performed, and the respective regression coefficient (β) and its confidence intervals (CI95%) were calculated.

Meditation practice was the independent variable and it was classified according to different degrees (they were all assessed as categorical variables). The number of months of practice was categorized into beginners (up to 12 months), intermediate (13-36 months), and advanced (> 36 months); the weekly frequency into low (1-4 times) and high (5-7 times); the daily frequency was categorized into \geq twice a day (yes or no); and each practice duration into < 30 minutes, from 30 to 59 minutes and \geq 60 minutes.

In the adjusted analyses each meditation variable was analyzed along with possible confounding variables: gender, age, marital status and education (model 1). The missing data rate for these covariates was 1.2%. In a second model, in order to evaluate possible mediators, the analyses were additionally adjusted for the five personality factors measured by the BFP: neuroticism, extraversion, openness to experience, agreeableness and conscientiousness (model 2). For all analysis, the statistical package STATA 9.0 has been used.

Results

Although 161 participants took part in this study, 142 remained for final statistical analysis. Fifteen people were excluded because they did not meet the inclusion

criteria, that is, according to their experience of meditation (beginner, intermediate, advanced) they should score a minimum of points when answering the operational definition. And four people were also excluded because of missing data on the GHQ. There were no differences for the average gender, age, marital status and education between the participants included and excluded. Also, in order to make sure that participants who were undergoing psychotherapy did not differ significantly in the psychological well-being score, a *Student t-Test* was carried out to compare their mean score on this variable with the other participants. Results showed there was no significant difference between the groups ($t(27.6) = 1.9; p = 0.7$).

Table 1 shows the results of the psychological well-being continuous score. The participants presented a mean score of 91.7 ($SD = 18.9$). In the Brazilian validation study of GHQ (Pasquali et al., 1994), the mean observed was 108.45 ($SD = 3.24$). A *Student t-Test* showed that this mean is significantly higher than the one for the current sample ($t(141) = -10.53; p < 0.001$), which indicates that the meditation practitioners investigated have statistically greater psychological well-being than the sample from the validation study. Concerning the main objective of this study, results obtained through hierarchical multiple linear regression analyses showed that the number of months of meditation was inversely associated with the score, which means that the greater the expertise, the greater the psychological well-being. This association remained significant after adjusting for the confounding variables included in model 1 (gender, age, marital status and education), but not after controlling for possible mediators included in model 2 (model 1 + the five personality factors). Concerning the weekly frequency, there was a significant inverse association with the score on the raw analyses and model 1, which means that the higher the weekly frequency of practice, the lower the score for GHQ and thus, greater psychological well-being; this association did not remain in model 2. The daily frequency and the duration of practice did not present any significant association with the continuous score in neither the raw nor the adjusted analysis (Table 1), although there seems to be an apparent inverse relationship between the duration of practice and the psychological well-being score in model 1. The personality variables in model 2 which mediated the association between experience of meditation and the degree of psychological well-being were neuroticism, conscientiousness and extraversion. The first two were positively associated with the score on GHQ and the latter inversely associated, all with values of $p < 0.05$. The other two personality factors – openness to experiences and agreeableness – did not present any associations with psychological well-being.

Table 1
Hierarchical Multiple Linear Regression - Raw and Adjusted Analyses of the Association between Time of Meditation Practice and Psychological Well-Being Score

	N	Raw Analyses			
		Mean (SD)	β (CI95%)	Adjusted 1 β (CI95%)	Adjusted 2 β (CI95%)
<i>Length in months</i>		<i>P=0,008#</i>	<i>P=0,008#</i>	<i>P=0,02#</i>	<i>P=0,7#</i>
Beginner	36	99,2 (25,6)	10,8(3,1;18,5)	10,3(2,2;18,4)	2,2(-4,4;8,7)
Intermediate	40	90,9(18,5)	2,5(-4,9;9,9)	0,4(-7,1;7,9)	-3,4(-9,4;2,6)
Advanced	69	88,4(13,6)	0,0	0,0	0,0
<i>Weekly frequency</i>		<i>P=0,2*</i>	<i>P=0,03**</i>	<i>P=0,02**</i>	<i>P=0,5**</i>
1-4 times	70	95,3(22,7)	6,8(0,5;13,0)	7,5(1,2;13,8)	1,7(-3,5;6,8)
5-7 times	75	88,5(14,1)	0,0	0,0	0,0
<i>Meditation \geq 2 times a day</i>		<i>P=0,3*</i>	<i>P=0,1**</i>	<i>P=0,4**</i>	<i>P=0,6**</i>
No	118	93,1(19,9)	6,2(-2,0;14,5)	3,6(-4,9;12,1)	2,0(-4,9;8,9)
Yes	26	86,8(13,0)	0,0	0,0	0,0
<i>Duration of each session</i>		<i>P=0,2#</i>	<i>P=0,2#</i>	<i>P=0,2#</i>	<i>P=0,7#</i>
< 30 minutes	41	94,3(25,6)	6,8(-2,9;16,5)	6,4(-3,2;16,0)	-1,5(-9,4;6,1)
30-59 minutes	79	91,9(16,4)	4,4(-4,4;13,2)	3,8(-4,9;12,5)	-1,9(-8,9;5,2)
60 or more	25	87,5(12,5)	0,0	0,0	0,0
Total	142	91,7 (18,9)			

Note. * Kruskal-Wallis Test for heterogeneous variance; # Test for Trend; ** Wald Test for heterogeneity; 1 Adjusted for sex, age, marital status and education; 2 Adjusted for 1 + personality traits (openness to experiences, extraversion, neuroticism, conscientiousness and agreeableness).

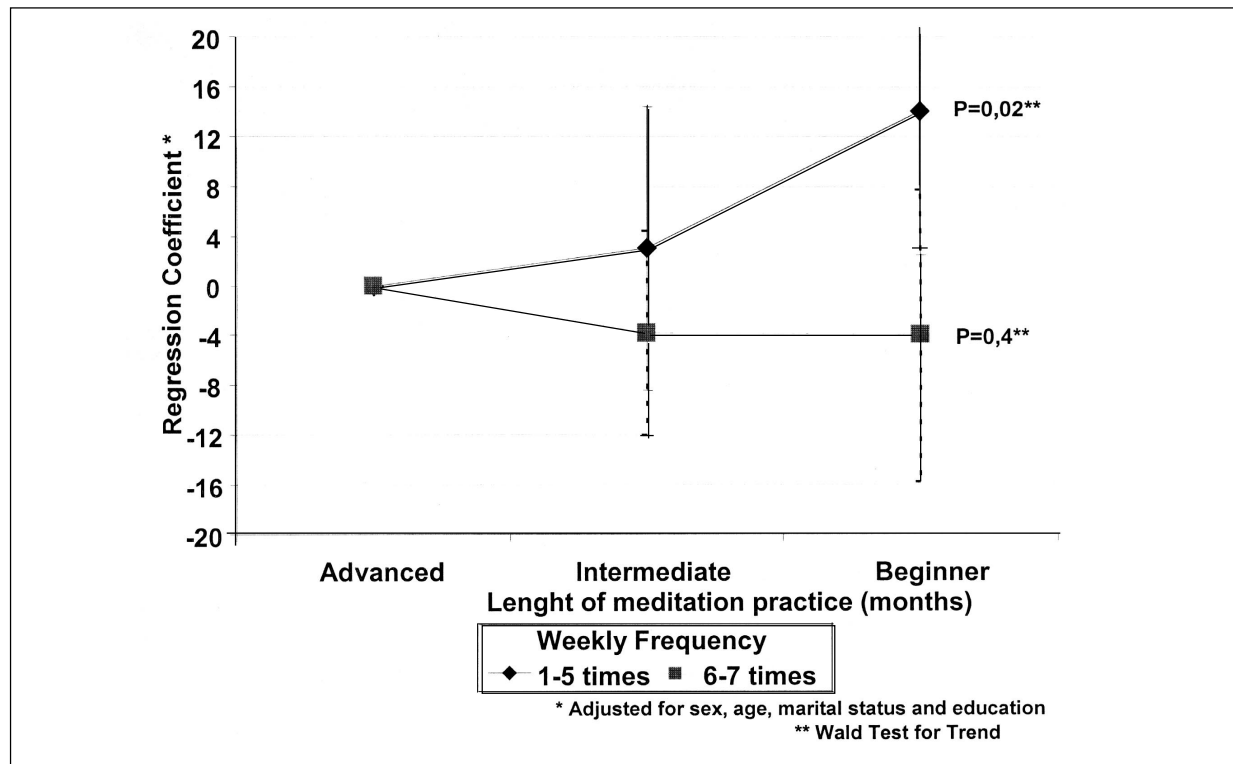


Figure 1. Association between length of meditation practice (months) and the psychological well-being score, stratified by weekly frequency

Results also showed an interaction between months and weekly frequency of practice in the association with the psychological well-being score (p for interaction 0.10) (Matthews & Altman, 1996). Figure 1 shows that for those practicing meditation 6/7 times a week there was no difference among advanced, intermediate and beginners in the psychological well-being score. Among those practicing meditation fewer times a week (1/5), there was an inverse association between the months of practice and the well-being score, even after adjusting for gender, age, marital status and education.

Discussion

The main aim of the current study was to investigate the relationship between the experience of meditation and psychological well-being. Results showed that the number of months of practice and weekly frequency were associated with psychological well-being, which means that in the sample investigated, the more years and the more times a week one practices meditation, the more psychological well-being one manifests. In agreement with this result, we also found that our sample of meditators presented a statistically greater psychological well-being than the Brazilian sample investigated in the validation of the GHQ score. Together, these results support previous findings, from cross-sectional studies (Baer et al., 2008; Brown & Ryan, 2003) and randomized controlled trials (Davidson et al., 2003; Jain et al., 2007; Shapiro et al., 2008), showing that meditation is associated with or can foster psychological well-being. There is growing evidence that increased mindfulness and self-awareness are important mechanisms through which meditation enhances well-being (Brown & Ryan, 2003; Nyklíček & Kuijpers, 2008; Shapiro et al., 2008). Another explanation is that with time, the practitioner increases his/her processing efficiency, which means he/she develops greater ability to inhibit cognitive and emotional processes (Brefczynski-Lewis et al., 2007; Lutz et al., 2004). This could explain, for example, why meditators show reductions in psychological symptoms like depression, anxiety and stress (Grossman et al., 2004). Moreover, both enhanced mindfulness and more efficient processing relate to self-regulation in practitioners of meditation (Arch & Craske, 2006; Lutz et al., 2008; Tang et al., 2007), a process which has been associated with psychological well-being (Davidson et al., 2000; Gross, 2002).

It seems that the expertise one has in technique plays an important role in the extent to which these benefits take place and manifest (Brefczynski-Lewis et al., 2007; Brown & Ryan, 2003; Lutz et al., 2004). The present findings give support to this idea. However, in the current study, added to the number of months of practice, the

weekly frequency also related to better psychological well-being and an interaction between number of months and weekly frequency has been observed. This means that for those people meditating from six to seven days a week, the levels of psychological well-being did not differ statistically among beginner, intermediate and advanced practitioners. This finding is in accordance with the fact that for any kind of training that seeks a positive outcome, be it either mental or physical, repetition is an important part of the process (Maguire et al., 2000; Slagter et al., 2007). In addition, it is in agreement with the usual recommendations from meditation centers that advise practitioners to meditate more often a week, even if for fewer minutes each time. Our findings did not show a significant association between the number of minutes of each practice and the number of times one practices a day with psychological well-being. We believe this is probably due to the fact that most meditators from our sample practice once a day (82%) and that nearly 50% meditate between 30 and 40 minutes. Some studies observed that the number of hours practiced a day had a significant effect on psychological outcomes, like enhanced attention (Jha, Krompinger, & Baime, 2007; Slagter et al., 2007) and decreased psychological distress (Ostafin et al., 2006). However, these studies evaluated intensive programs, where practitioners meditated from 10 to 12 hours a day for a few weeks or months. Based on our findings, it seems that practicing at least once a day for approximately 30 minutes – the mean practice duration for the present sample – but on a regular daily basis, is a good option to experience benefits such as psychological well-being. In fact, this finding also gives support to why many studies using meditation based programs that last a few months (Carmody & Baer, 2008; Davidson et al., 2003; Nyklíček & Kuijpers, 2008; Shapiro et al., 2008) or even days (Chambers et al., 2008; Tang et al., 2007) show significant improvements in psychological outcomes. Daily practice is a key element in all these programs.

According to Buddhist tradition, for example, it is necessary to practice regularly in order to be able to be mindful on a regular basis, which in turn leads to stable mental balance and well-being (Wallace & Shapiro, 2006). However, even though increased mindfulness has been found to be one of the main variables mediating the influence meditation can have on well-being (Brown & Ryan, 2003), one study observed only a partial effect of this quality, suggesting that other variables might play a part (Carmody & Baer, 2008). Thus, the current study controlled the relationship between meditation and psychological well-being for the potential mediating role of personality. The results showed that the association between the practice of meditation – number of months and weekly frequency – and well-being lost its signifi-

cance when including personality traits in the model. More specifically, extraversion showed a positive association with well-being, whereas neuroticism and conscientiousness showed a negative one. However, because this is a cross-sectional study, we should be cautious when assuring whether or not these traits are confounding or mediating factors. Nevertheless, we understand there are reasons to believe that personality is mediating the effects of meditation on well-being.

Firstly, because it is argued that when one wishes to assess a mediating effect, the choice of factors to be included in the multivariate model should not be based purely on statistical associations, but on a conceptual framework describing the hierarchical relationships between the variables, where the mediating factor is a link between the exposure and the outcome (Victora, Huttly, Fuchs, & Olinto, 1997). In the present study, personality has been included in the regression model on a higher level than well-being, because it has been widely discussed that personality reflects more stable traits, whereas well-being reflects more transient feelings (Diener et al., 2003). Secondly, because there is data suggesting that meditation can influence personality; therefore, personality could be in the causal chain between meditation and well-being. For example, it has been found that the time of practice of meditation related to an increase in positive personality traits measured by the Sixteen Personality Factors Questionnaire (Sridevi & Krishna Rao, 1998). Also, the fact that meditation could reduce neuroticism, which is characterized by propensity to emotional suffering, anxiety, maladaptive coping strategies, depression, impulsivity, among others, is in agreement with data showing the impact of meditation on the reduction of psychological symptoms, like anxiety, depression and stress (Carmody & Baer, 2008; Grossman et al., 2004). On the other hand, the influence on extraversion, which is characterized by sociability, capability to be cheerful, talkativeness, optimism, affectivity, among others, corroborates research showing that meditation can foster positive psychological outcomes (Nyklíèek & Kuijpers, 2008; Shapiro et al., 2005). In addition, it is believed that enhanced self-regulation contributes to changes in personality characteristics (Davidson et al., 2000) and there is some evidence showing that meditation can promote better regulation (Lutz et al., 2008; Tang et al., 2007). Likewise, taking into account that personality, according to the big five model, is a product of biological and environmental influences (Nunes et al., 2008), and because it has been shown that meditation is associated to physiological changes, such as larger volumes in brain structures (Luders, Toga, Lepore, & Gaser, 2009) and specific brain patterns (Lutz et al., 2004), it is possible to suggest that the practice of meditation can influence personality traits. Moreover, mindfulness, as measured

by mindfulness scales which significantly relate to meditation experience, correlated negatively with neuroticism (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006; Brown & Ryan, 2003), although Baer et al. (2006) did not find a significant positive correlation with extraversion. Thirdly, in our model, personality is mediating the effects of number of months and weekly frequency, that is, the length of experience of meditation. This is understandable if we consider that personality is characterized by dispositional qualities that probably need time to change, in opposition to situational characteristics. In line with this, the interaction we observed between weekly frequency and number of months probably occurs because the everyday practice influences in the short-term a more state-like well-being, whereas in the long-term, the number of months influences trait-like characteristics, promoting long-lasting effects on well-being. Fourthly, the mediating effect of personality corroborates the idea supported by Carmody and Baer (2008) that other variables besides mindfulness should be included in models trying to explain the influence of meditation on well-being.

One possibility is that increased mindfulness is mediating the role meditation has on personality. It has been found that the more mindful someone is, the more in tune he/she is with implicit and explicit emotions, indicating that mindfulness is related to heightened self-knowledge and self-awareness (Brown & Ryan, 2003). Therefore, people who know themselves better, perhaps self-regulate better, acquiring more control over their temperament and personality. Because personality, as measured by the big five model, has been understood according to the trait theory, we propose that meditation, on a daily basis, influences mindfulness, which through self-regulation influences personality traits in the long-run, which in turn promotes long-lasting effects on well-being. However, according to some authors (Wallace & Shapiro, 2006), it is important that practitioners have been initially motivated to establish their intentions for the practice. Only then are they able to train sustained attention, which with time leads to control over cognitive and affective processes. Thus, this raises one further question that has yet to be tested: whether personality plays a part in the first place, when people seek for meditation and set intentions for their practice.

One surprising result that emerged was conscientiousness being one of the possible mediating factors, but in an unexpected direction, as it was negatively associated with well-being. Previous research has shown a positive correlation between these two variables (Hayes & Joseph, 2003) and high conscientiousness has been related to longevity (Roberts, Walton, & Bogg, 2005) and less engagement in risky health-related behaviors (Tucker, Elliott, & Klein, 2006). But considering cons-

conscientiousness encompasses traits such as achievement, motivation for success, order, responsibility, punctuality, among others, it could be that meditators from our sample interpreted these characteristics in a negative way, perhaps relating them to everyday and workplace stressful obligations and duties, in some way resembling a feeling of being under pressure, and/or resembling western values, such as competitiveness and a sense of excelling oneself, in contrast to eastern values, like detachment and social service. One study that investigated how the five traits reflect affective, behavioral and cognitive dimensions, found that conscientiousness was rated significantly higher than all other traits on the behavioral dimension (Zillig, Hemenover, & Dienstbier, 2002). Therefore, given that conscientiousness is usually related to academic and professional contexts, its characteristics, when taken into account in a practical sense, could resemble necessary, but stressful duties and/or western values. One hypothesis is that through meditation and the principles one tries to cultivate through the practice, the practitioners in our sample could reduce their sense of conscientiousness, interpreted as very demanding or incongruous, thus having greater well-being.

Limitations and Suggestions

Although we believe there is strong evidence for personality being a mediator, and although our results support previous data showing the impact of meditation on well-being, we can not rule out the possibility of a reverse causality, that is, meditators could always have had these personality traits, which influenced their well-being, which in turn influenced their decision to meditate. In other words, the meditators in our sample could have had lower levels of neuroticism and conscientiousness and higher levels of extraversion from the start, therefore having greater well-being and feeling more prone to meditate as a result. On the other hand, other studies indicate that meditation has been consistently associated with well-being and personality seemed to mediate the temporal effect of meditation according to our data. Thus, one hypothesis is that even if personality plays a role on well-being and on the practice of meditation in the first place, it is also through the mediating effects of traits – in the sense of heightened positive traits and weakened negative traits – that meditation can promote long-lasting effects on well-being.

Another limitation is the non probabilistic sample, which could result in some kind of bias and which does not represent meditators in general. Nonetheless, our findings are consistent with previous studies. Also, because we used self-report measures, analyses would have been more complete if a social desirability instru-

ment had been used. In addition to that, when invited to participate in the research, participants read the informed consent, which stated that the aim of the research was to investigate the psychological effects of meditation. Therefore, demand characteristics are not ruled out. Finally, our regression model might have not included other variables that could also play a part in the relationship between meditation and well-being.

In order to evaluate causal changes in personality, we recommend a longitudinal study investigating people who are initiating their practice. Also, given that our findings suggest that personality is a mediator in the relationship between meditation and well-being and that increased mindfulness and self-awareness also seem to mediate this relationship, additional studies should investigate whether the changes in personality are indeed caused by increased mindfulness and better self-regulation.

Conclusion

The present study investigated the relationship between the practice of meditation and psychological well-being. Our findings indicate that the more practice one has in meditation, the greater psychological well-being one manifests. In addition, results also suggest that for people meditating from six to seven days a week, the effects on well-being are the same for those who have been meditating for one year or longer. Moreover, the effects observed on well-being seem to take place through changes in personality. We suggest that studies investigating interactions between meditation practice and personality traits should be carried out. These findings have important implications in the field of health, especially psychology, and give support for the therapeutic use of meditation as also for its use as a tool for cultivating mental health.

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