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# Everyday mindfulness and mindfulness meditation: Overlapping constructs or not?

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## Abstract

Elaborating on our understanding of the construct of mindfulness is currently a priority as mindfulness-based therapeutic interventions proliferate (Bishop et al., 2004). Two studies examined the relationship between measures of everyday mindfulness, mindfulness during meditation, and the five-factor model personality domains. These studies also investigated the effect of sitting meditation on mood. Two samples were largely naïve to formal sitting meditation, and the third sample was screened for meditation experience. The first study found that everyday mindfulness correlated positively with agreeableness and conscientiousness, and correlated negatively with neuroticism. Little to no relationship was found between mindfulness during meditation and everyday mindfulness across all three samples. Changes in mood following meditation varied across studies.

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*Keywords:* Mindfulness; Meditation; Measures; Mood; Personality

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## 1. Introduction

“Mindfulness” refers to a way of orienting one’s self to the present moment. Definitions of mindfulness commonly emphasize that it involves maintaining awareness on one’s immediate

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experience, as opposed to being distracted by past or future oriented thoughts, or engaged in avoidance of one's experience. It also involves maintaining an attitude of "nonjudgment" (Bishop et al., 2004; Kabat-Zinn, 2003).

The past two decades have seen a proliferation of mindfulness-based psychotherapeutic treatments (e.g., Kabat-Zinn, 1990; Linehan, 1993; Segal, Williams, & Teasdale, 2002). Two in particular, mindfulness-based stress reduction (Kabat-Zinn, 1990) and mindfulness-based cognitive therapy (Segal et al., 2002), emphasize sitting and walking meditation and yoga practices. These interventions involve regular, concentrated practice in which the participant focuses attention on a particular stimulus, such as his/her breath, sensations in the body, etc., during a particular period of time. These practices are intended to help cultivate "everyday mindfulness." Everyday mindfulness involves maintaining the open, accepting, present focus of attention during day-to-day life. Interestingly, the relationship between one's ability to stay focused and mindful during mindfulness practice, and one's degree of mindfulness in everyday life remains unclear.

Self-report measures of mindfulness have focused on either everyday mindfulness or mindfulness during sitting meditation. Little research has examined the relationship between these two constructs. Bishop et al. (2005), for example, created the Toronto Mindfulness Scale (TMS), a measure of mindfulness during formal sitting meditation. By contrast, Brown and Ryan's (2003) Mindful Attention Awareness Scale (MAAS) and Feldman, Hayes, Kumar, and Greeson's (2003) Cognitive and Affective Mindfulness Scale-Revised (CAMS-R) both assess how mindful individuals are during their everyday lives. It appears that to date no one has empirically examined whether there is a relationship between these two constructs.

That everyday mindfulness can be measured presumes that it is a semi-consistent trait or tendency that exists across situations; it thus may be related to specific personality traits. It is unclear whether everyday mindfulness may shape personality or personality may shape everyday mindfulness or whether both are shaped by other factors. In exploring the construct validity of their scales, the developers of the MAAS and the TMS examined correlations between the mindfulness scales and some of the five-factor model personality characteristics, the five domains being neuroticism, openness to experience, extraversion, agreeableness, and conscientiousness. Openness to experience, a tendency to seek and appreciate experience for its own sake, was positively correlated with everyday mindfulness as measured by the MAAS and the CAMS-R, and with mindfulness during meditation as measured by the TMS (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006; Bishop et al., 2005; Brown & Ryan, 2003). Neuroticism, proneness towards worry and irritability, was negatively correlated with the MAAS and the CAMS-R (Baer et al., 2006; Brown & Ryan, 2003). Extraversion exhibited no significant relationship with the MAAS or CAMS-R (Baer et al., 2006); however, there has not been any research that has compared these mindfulness measures on the remaining five-factor model domains: conscientiousness and agreeableness.

The primary goals of this study were to examine the relationships between measures of everyday mindfulness and mindfulness during meditation, and between measures of mindfulness and personality characteristics. Study 1 examined the relationships between everyday mindfulness, mindfulness during meditation, and personality characteristics. Following completion of the first study, a new measure, the Five-Factor Mindfulness Questionnaire (FFMQ; Baer et al., 2006), that assessed everyday mindfulness as a multidimensional construct was published. Study 2 was conducted to examine the relationship between the multidimensional conceptualization of everyday

mindfulness captured in the FFMQ and mindfulness during meditation. Study 2 differed from Study 1 in that it compared a sample of individuals largely naïve to meditation against a sample of experienced meditators. A secondary goal of these studies was to investigate the immediate impact of mindfulness practice on mood. Very little research has addressed the immediate impact of mindfulness practice on mood, which may be related to a person's tendency to continue or discontinue practice.

## 2. Study 1

The first study examined the relationships between everyday mindfulness, mindfulness during meditation, personality characteristics, and mood. The first question addressed in this study is, to what extent are measures that focus on day-to-day engagement in mindful awareness measuring the same thing as measures that focus on mindful awareness during sitting meditation? Research and theory in this area appear to assume that greater ability to focus mindfully during sitting meditation practice should be related to more frequent and pervasive mindful awareness during day-to-day life. Thus we would expect significant positive correlations between measures of everyday (trait) mindfulness and measures of mindfulness during sitting meditation.

The second issue addressed in this study is the relationship between mindfulness and personality characteristics. As previous research has found a positive relationship between mindfulness and openness to experience, a negative relationship between mindfulness and neuroticism, and no relationship between mindfulness and extraversion, we expected to find a similar pattern of results. Further, as mindfulness includes an orientation focused on awareness and acceptance of the present moment, we hypothesized that there would be a significant positive correlation between mindfulness and conscientiousness and agreeableness. Lastly, as we expected that our sample would be largely naïve to formal sitting meditation, we included exploratory analyses of the impact of meditation on mood, as it is not uncommon for individuals to find their first experience of meditation aversive because of the inherent difficulty and frustration in focusing on their breath.

### 2.1. Method

#### 2.1.1. Participants

A total of 171 Introductory Psychology students participated. Participants received experimental credit in their Psychology 100 course for participating. Four participants were excluded from analysis due to language or related issues. Consequently, 167 participants were included in the analyses. Of these there were 118 females and 49 males. Ages ranged from 18 to 52, with 19 being the modal age. (Due to a clerical error, ages were not recorded for 22 of the 167 participants, but their data were included.)

#### 2.1.2. Materials

2.1.2.1. *Mindful Attention Awareness Scale (MAAS; Brown & Ryan, 2003)*. The 15-item MAAS measures everyday mindfulness; items are rated on a 6-point Likert scale from 1 (almost always)

to 6 (almost never). The mean rating across all items is computed. Higher scores reflect greater mindfulness.

*2.1.2.2. Cognitive and Affective Mindfulness Scale-Revised (CAMS-R; Feldman et al., 2003).* The 12-item CAMS-R measures everyday mindfulness and focuses on the degree to which examinees experience their thoughts and feelings. Items are rated on a 4-point Likert scale from 1 (rarely/not at all) to 4 (almost always). Ratings on the items are summed. Higher scores reflect greater mindfulness.

*2.1.2.3. The Toronto Mindfulness Scale (TMS; Bishop et al., 2005).* The 10-item TMS measures the extent to which participants report having been mindful during a period of sitting meditation. Immediately following meditation, examinees are asked to rate items reflecting what they experienced during the period of meditation. Items are rated on a 5-point Likert scale from 0 (not at all) to 4 (very much). Scores on the scale are summed. The TMS has since been revised into a two-factor measure, and the item wording changed (Lau et al., 2006).

*2.1.2.4. International Personality Item Pool (IPIP; Goldberg, 1999).* The IPIP is a public domain set of personality items that offers scales that measure constructs similar to other personality inventories using the five-factor model. The five-factor model was operationalized in the Revised NEO-Personality Inventory (NEO-PI) (Costa & McCrae, 1995). The IPIP offers free scales that highly correlate with the NEO-PI. A series of self-descriptive statements are rated on a scale from 1 (very inaccurate) to 5 (very accurate). Scores on the scale are summed. We used a 50-item questionnaire.

*2.1.2.5. Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988).* The PANAS is a 20-item scale that measures positive affect (PA) and negative affect (NA). PA refers to “the extent to which a person feels enthusiastic, active, and alert” and NA refers to “subjective distress and unpleasurable engagement that subsumes a variety of aversive mood states, including anger, contempt, disgust, guilt, fear, and nervousness” (p. 1063). Items are self-rated on a 5-point Likert scale from 1 (very slightly or not at all) to 5 (extremely). Scores for PA and NA are summed. The PANAS is also sensitive enough to capture shifts in mood.

### *2.1.3. Procedure*

Participants were run in groups of up to 15 at a time. They completed the measures and engaged in a 15-min meditation. For the meditation, participants were asked to shift their chairs to face a blank wall behind them. Meditation instructions were expanded from those in Bishop et al. (2005), which the researchers felt would be unclear to participants with no previous exposure to sitting meditation. Participants were asked to follow the flow of their breath for 15 min, and to bring their attention back to the breath if they were distracted.

After 15 min, participants turned their chairs back around and completed the remaining measures. The order of administration of the measures was counter-balanced to account for any influence the period of meditation might have on scores for the MAAS and the CAMS-R. Group A ( $n = 86$ ) completed all measures except the TMS and the post-meditation PANAS before the 15-min meditation. Group B ( $n = 81$ ) completed the pre-meditation PANAS, meditated for 15-min, and then completed the remaining measures.

## 2.2. Results and discussion

### 2.2.1. Internal consistency of measures

Cronbach's alpha was computed for all measures to establish internal consistency. Cronbach's alpha was above 0.70 for all measures: MAAS ( $\alpha = 0.84$ ), CAMS-R ( $\alpha = 0.79$ ), TMS ( $\alpha = 0.77$ ), PANAS (pre-meditation PA,  $\alpha = 0.87$ ; post-meditation PA,  $\alpha = 0.90$ ; pre-meditation NA,  $\alpha = 0.85$ ; post-meditation NA,  $\alpha = 0.83$ ), and IPIP (neuroticism,  $\alpha = 0.87$ ; extraversion,  $\alpha = 0.83$ ; openness to experience,  $\alpha = 0.79$ ; agreeableness,  $\alpha = 0.73$ ; conscientiousness,  $\alpha = 0.80$ ).

### 2.2.2. Order effect

Independent samples *t*-tests were computed on the differences in scores between participants who completed the everyday mindfulness and personality measures before the meditation (Group A), and those who completed them after the meditation (Group B). The only statistically significant difference was for the MAAS [ $t(163) = 2.97, p = 0.003$ ], although the effect size was small (partial  $\eta^2 = 0.05$ ). Group A [ $M = 3.89, SD = 0.63$ ] scored higher in everyday mindfulness than Group B [ $M = 3.57, SD = 0.74$ ]. As the effect size was small, subsequent analyses were conducted on both groups together.

### 2.2.3. Hypothesis 1: everyday mindfulness and mindfulness during meditation

The first hypothesis was that there would be a statistically significant correlation between everyday mindfulness and mindfulness during sitting meditation. Everyday mindfulness was measured using the MAAS and CAMS-R, and mindfulness during sitting meditation was measured using the TMS. Pearson product-moment correlation coefficients were computed between the MAAS, the CAMS-R and the TMS. A significant relationship was found between the MAAS and the CAMS-R [ $r = 0.60, p = 0.000$ ], but no statistically significant relationship was found between the TMS and the MAAS [ $r = -0.14, p = 0.08$ ] or between the TMS and the CAMS-R [ $r = -0.11, p = 0.18$ ]. Therefore, the first hypothesis was not supported.

### 2.2.4. Hypothesis 2: mindfulness and personality characteristics

The second hypothesis was that there would be a positive correlation between mindfulness and openness to experience, conscientiousness, agreeableness, a negative correlation between mindfulness and neuroticism, and no correlation between mindfulness and extraversion. Mindfulness was measured using the MAAS, CAMS-R, and TMS, and personality was measured using the five-factor model of the IPIP. Pearson product-moment correlation coefficients were computed between the mindfulness scales and the measure of the personality domains (see Table 1).

### 2.2.5. Mindfulness and mood

Paired samples *t*-tests were computed to test for differences in mood pre- and post-meditation. The difference between scores of PA pre- ( $M = 25.75, SD = 7.69$ ) and post-meditation ( $M = 22.25, SD = 8.28$ ) was statistically significant [ $t(165) = -6.88, p = 0.000$ ], with a moderate effect size (partial  $\eta^2 = 0.22$ ). The difference between scores on NA pre- ( $M = 15.52, SD = 5.68$ ) and post-meditation ( $M = 14.17, SD = 5.01$ ) was statistically significant [ $t(165) = -4.60, p = 0.000$ ], with a moderate effect size (partial  $\eta^2 = 0.11$ ). Both PA and NA decreased from pre- to post-meditation.

Table 1

Pearson correlation coefficients between mindfulness and five-factor model personality characteristics

	Neuroticism	Extraversion	Openness to experience	Agreeableness	Conscientiousness
MAAS	−0.41*	−0.05	0.04	0.29*	0.28*
CAM-R	−0.58*	−0.01	0.04	0.43*	0.27*
TMS	0.13	0.06	0.23*	−0.07	0.02

Note: MAAS = Mindful Attention Awareness Scale; CAMS-R = Cognitive and Affective Awareness Scale-Revised; TMS = Toronto Mindfulness Scale.

\*  $p < 0.01$ .

### 2.3. Discussion

The results of Study 1 do not support the notion that everyday mindfulness is related to the ability to be mindful during formal sitting meditation, at least in a sample of individuals naïve to meditation. The results may suggest that everyday mindfulness is a different construct from mindfulness during meditation, that individuals who are mindful during everyday life may not be more mindful during sitting meditation than individuals who are less mindful during everyday life. Results partially support the second hypothesis, as everyday mindfulness was positively correlated with agreeableness and conscientiousness, and negatively correlated with neuroticism. No relationship was found between everyday mindfulness and extraversion and openness to experience. Mindfulness during meditation was positively correlated with openness to experience, but no relationship was found between mindfulness during meditation and neuroticism, extraversion, agreeableness, and conscientiousness. Lastly, there was a significant reduction in both positive and negative affect following the period of sitting meditation.

## 3. Study 2

Subsequent to the completion of Study 1, Baer et al. (2006) published the Five-Factor Mindfulness Questionnaire (FFMQ), which was derived from a factor analysis of five previously developed mindfulness measures. This yielded a 39-item questionnaire. The five factors are: nonreactivity to inner experience; observing thoughts and feelings; acting with awareness; describing/labeling with words; and nonjudging of experience. The availability of a more comprehensive measure of everyday mindfulness utilizing these five factors allowed for an additional examination of the relationship between everyday mindfulness and mindfulness during sitting meditation. The current study further explored the question of the relationship between mindfulness during sitting meditation and everyday mindfulness, using the five factors identified in the FFMQ. We were also interested in comparing participants who were naïve to meditation with experienced meditators.

### 3.1. Method

#### 3.1.1. Participants and procedures

We initially collected a sample of 185 Introductory Psychology students. We then screened another group of Introductory Psychology students ( $n = 18$ ) for previous experience with “Buddhist

or mindfulness meditation.” After collecting this second sample, we separated from the initial sample of 185 participants individuals with previous meditation experience ( $n = 13$ ) using the demographics questions which asked question about mindfulness practices. Our inclusion criteria were that the participants had a current meditation practice, and that they were able to specify a particular period of time for which they had been meditating. The latter criterion was chosen to distinguish those with formal exposure to meditation from those who may possess a more vague understanding of meditation (e.g., prayer, running, listening to music). We combined the data of these experienced meditators from the larger sample ( $n = 13$ ) with those for which we had initially screened prior to participation ( $n = 18$ ). This left us with two samples: one naïve to meditation ( $n = 172$ ) and one experienced in meditation ( $n = 31$ ).

The naïve sample consisted of 71 male and 101 female participants. Age ranged from 18 to 53, and the modal age was 19. The sample of experienced meditators consisted of 20 male and 11 female participants. Ages ranged from 18 to 49, with 19 being the modal age. Experience with sitting meditation ranged from 1 month to 30 years. Participants averaged 2 h of sitting meditation per week ( $M = 2.39$ ,  $SD = 2.12$ ). As there appeared to be little order effect in the first study, order of administration was not counterbalanced. Participants meditated for 15 min and completed the TMS and FFMQ. The PANAS was administered before and after the meditation.

### 3.2. Results and discussion

Cronbach’s alpha was computed for each measure. In the naïve sample, alphas were: TMS ( $\alpha = 0.72$ ); FFMQ (observe subscale,  $\alpha = 0.71$ ; describe subscale,  $\alpha = 0.91$ ; act with awareness subscale,  $\alpha = 0.85$ ; nonjudge subscale,  $\alpha = 0.90$ ; nonreactivity subscale,  $\alpha = 0.72$ ), and PANAS (pre-meditation PA,  $\alpha = 0.86$ ; post-meditation PA,  $\alpha = 0.86$ ; pre-meditation NA,  $\alpha = 0.81$ ; post-meditation NA,  $\alpha = 0.81$ ). In the meditator sample, alphas were: TMS ( $\alpha = 0.78$ ); FFMQ (observe subscale,  $\alpha = 0.72$ ; describe subscale,  $\alpha = 0.90$ ; act with awareness subscale,  $\alpha = 0.86$ ; nonjudge subscale ( $\alpha = 0.91$ ); nonreactivity subscale,  $\alpha = 0.88$ ), and PANAS (pre-meditation PA,  $\alpha = 0.88$ ; post-meditation PA,  $\alpha = 0.90$ ; pre-meditation NA,  $\alpha = 0.81$ ; post-meditation NA,  $\alpha = 0.89$ ).

Pearson product-moment correlation coefficients were computed between each of the five factors of the FFMQ and the TMS. In the naïve sample, a statistically significant correlation was found between the TMS and the observe subscale [ $r = 0.19$ ,  $p = 0.01$ ]. Statistically significant correlations were not found in the naïve sample between the TMS and the remaining four subscales of the FFMQ. In the meditator group, no statistically significant correlation coefficients were found between the TMS and the FFMQ (see Table 2).

Paired samples  $t$ -tests were computed to test for differences in mood pre- and post-meditation on the PANAS. In the naïve sample, the mean difference between scores of PA pre- ( $M = 26.92$ ,  $SD = 7.74$ ) and post-meditation ( $M = 24.12$ ,  $SD = 8.61$ ) was statistically significant [ $t(170) = 6.83$ ,  $p = 0.000$ ], with a moderate effect size (partial  $\eta^2 = 0.22$ ). The difference between scores on NA pre- ( $M = 15.51$ ,  $SD = 5.14$ ) and post-meditation ( $M = 14.90$ ,  $SD = 5.63$ ) followed a similar trend but was not statistically significant [ $t(171) = 1.78$ ,  $p = 0.08$ ]. In the meditator sample, the difference between scores of PA pre- ( $M = 27.68$ ,  $SD = 7.13$ ) and post-meditation ( $M = 27.80$ ,  $SD = 8.59$ ) was not statistically significant [ $t(30) = -0.17$ ,  $p = 0.87$ ]. The difference between scores on NA pre- ( $M = 13.77$ ,  $SD = 4.28$ ) and post-meditation ( $M = 13.13$ ,  $SD = 5.30$ ) was not statistically significant either [ $t(30) = 0.78$ ,  $p = 0.44$ ].

Table 2

Pearson correlation coefficients between everyday mindfulness and mindfulness during meditation

	Five-factor mindfulness questionnaire				
	Observe	Describe	Act with awareness	Nonjudgment	Nonreactivity
<b>TMS</b>					
1. Naïve	0.19*	0.03	−0.10	−0.08	0.12
2. Meditators	0.18	−0.12	−0.20	0.09	0.06

Note: TMS = Toronto Mindfulness Scale.

\*  $p < 0.05$ .

In order to assess whether there were any differences in scores between the naïve sample and experienced meditators, independent samples  $t$ -tests were computed between TMS, FFMQ, and PANAS scores for the two samples. The means in the meditator sample were significantly higher than the naïve sample on the TMS ( $M = -3.77$ ,  $SD = 1.17$ ;  $t(201) = -0.32$ ,  $p = 0.002$ ), the FFMQ observe subscale ( $M = -2.31$ ,  $SD = 0.90$ ;  $t(201) = -2.57$ ;  $p = 0.01$ ), the FFMQ nonreactivity subscale ( $M = -1.56$ ,  $SD = 0.80$ ;  $t(201)$ ,  $p = 0.05$ ), and post-meditation PANAS PA ( $M = -3.70$ ,  $SD = 1.68$ ;  $t(201) = -2.20$ ;  $p = 0.03$ ). Effects sizes were calculated for the significant differences: TMS (Cohen's  $d = 0.45$ ), observe (Cohen's  $d = 0.36$ ), nonreactivity (Cohen's  $d = 0.27$ ), and post-meditation PANAS PA (Cohen's  $d = 0.31$ ). There were no statistically significant differences between groups on the FFMQ describe subscale ( $M = -0.44$ ,  $SD = 1.25$ ;  $t(200) = -0.36$ ,  $p = 0.72$ ), FFMQ act with awareness subscale ( $M = -1.45$ ,  $SD = 1.03$ ;  $t(201) = -1.41$ ,  $p = 0.16$ ), FFMQ nonjudge subscale ( $M = -1.92$ ,  $SD = 1.27$ ;  $t(201) = -1.51$ ,  $p = 0.13$ ), pre-meditation PA ( $M = -0.74$ ,  $SD = 1.49$ ;  $t(200) = -0.50$ ,  $p = 0.62$ ), pre-meditation NA ( $M = 1.80$ ,  $SD = 0.99$ ;  $t(201) = 1.82$ ,  $p = 0.07$ ), and post-meditation NA ( $M = 1.84$ ,  $SD = 1.09$ ;  $t(201) = 1.69$ ,  $p = 0.09$ ).

Results partially support our hypothesis. In the naïve sample, there was a modest relationship between the TMS and the observe factor of the FFMQ, but there was no relationship between the TMS and the remaining four factors. Results showed no relationship between the TMS and any of the FFMQ subscales among experienced meditators. Compared with the naïve sample, experienced meditators reported greater mindfulness during meditation, greater ability to observe one's experiences, and a tendency to be less reactive to aversive stimuli. This suggests that experience in meditation is related to greater mindfulness in some domains. Also, interestingly, whereas individuals who were inexperienced in meditation exhibited a decrease in positive affect following meditation, those with meditation experience exhibited no change in positive affect. It is possible that the affective experience of meditation may be somewhat different for meditators than it is for non-meditators.

#### 4. General discussion

The results of both studies found little relationship between mindfulness during meditation and everyday mindfulness. The first study found no relationship between mindfulness during meditation and everyday mindfulness, when everyday mindfulness was measured as a unidimensional construct referring to the degree to which individuals are mindful as they go about their daily

lives. There was some indication in the second study, which looked at five factors of everyday mindfulness, that mindfulness during meditation is related to the ability to observe one's experience in everyday life, at least in a sample of participants who are largely naïve to meditation; however, this finding was not replicated in a sample of more experienced meditators.

It may be that the TMS is not a sufficiently sensitive instrument. Bishop et al. (2005) note that, although the TMS discriminated between individuals with no meditation experience and individuals with 8 weeks of experience with mindfulness meditation, it did not discriminate between individuals with 8 weeks of experience from those with 2 or more years of meditation experience. The authors suggest that this may reflect a lack of sensitivity in the measure. Perhaps research using the revised, two-dimensional version of the TMS may identify relationships between the two kinds of mindfulness, although Lau et al. (2006) acknowledged that it has not been established whether scores on the revised TMS generalize to mindfulness in everyday life.

Lastly, it should not be overlooked that perhaps there is no relationship between everyday mindfulness and mindfulness during meditation. This would be surprising, given the fact that, compared to the naïve sample, the meditator sample exhibited greater mindfulness during meditation, a greater ability to observe experience, and less reactivity towards aversive stimuli. It is quite possible that individuals with a greater natural ability in everyday mindfulness are more likely to gravitate towards meditation. However, it is also possible that regular practice of meditation is more important for cultivating everyday mindfulness than how mindful one is during practice. Mindfulness during meditation may be a form of *state* mindfulness that is not representative of the more *trait* mindfulness found in everyday mindfulness, as the relationship between the two constructs may not be linear.

Relationships between mindfulness and personality characteristics found in this study support Brown and Ryan's (2003) findings that everyday mindfulness is negatively correlated with neuroticism. As Brown and Ryan suggest, being mindful may lower neurotic tendencies, or neuroticism may interfere with mindfulness. However, contrary to Brown and Ryan's findings, everyday mindfulness was not correlated with openness to experience, which consists of intellectual curiosity, a need for novelty, and aesthetic interests. As Brown and Ryan used the full NEO-PI, whereas this study used Goldberg's International Personality Item Pool (IPIP; Goldberg, 1999) to approximate the domains of the NEO-PI, perhaps the findings are due to the difference in measures. Interestingly, a relationship was found between openness to experience and mindfulness during sitting meditation and openness to experience, supporting Bishop et al.'s (2005) findings. There may be some overlap in constructs between the attitude of individuals high in openness to experience and individuals who are more mindful during sitting meditation. There was no relationship between mindfulness and extraversion, supporting Baer et al. (2006). Results do indicate a positive relationship between everyday mindfulness and agreeableness and conscientiousness. This makes intuitive sense. As conscientiousness refers to a degree of organization and motivation in carrying out goals, it would seem that one would need to be mindful to be conscientious. Agreeableness is characterized by compassion, humility, and a concern for others. As these are all very Buddhist virtues (although not exclusive to Buddhism), this finding supports the traditional notion of a relationship between the cultivation of mindfulness and the development of greater compassion.

Results on the effect of meditation on mood are mixed. As participants in the first study exhibited a significant decrease in positive and negative affect, and participants in the second study exhibited a significant decrease in positive affect only, one may surmise that meditation may

reduce intensity of feelings, at least in inexperienced meditators. This finding is consistent with the traditional goal of meditation as a method for achieving a state of equanimity, where the passions are not excited. However, it is also possible that these trends reflect a regression towards the mean, and that similar patterns would be observed if the participants had simply sat quietly for 15 min. There are a few possible explanations for the lack of significant change in affect in the sample of experienced meditators: experienced meditators may have a different affective experience of meditation or they may exhibit more stable moods than non-meditators.

## 5. Limitations and future directions

Although this study takes important steps in examining the relationship between everyday mindfulness and mindfulness during meditation, several limitations remain. For one, due to the contrived nature of the study, participants, particularly the non-meditating samples, may not have been sufficiently motivated to engage in 15 min of meditation. Moreover, there are two particular limitations of the experienced meditator sample. Firstly, as the sample was relatively young (modal age was 19) and may not have been practicing meditation for more than a few years, results may not be as strong as they might with participants with decades of meditation experience. In addition, because of the small sample size of experienced meditators, there may not have been sufficient statistical power to achieve significance on some of the results.

Lastly, due to the correlational nature of the study, pre-existing relationships between everyday mindfulness and mindfulness during meditation cannot be ruled out. Longitudinal studies may help to examine whether personality traits and aspects of mindfulness change over time in individuals beginning a mindfulness-based treatment. McCrae (1991) suggested that although personality appears stable after age 30, psychotherapy may bring about changes in personality. Regular mindfulness practice may alter existing personality traits, or conversely, existing personality traits may interfere with the regular practice of mindfulness.

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