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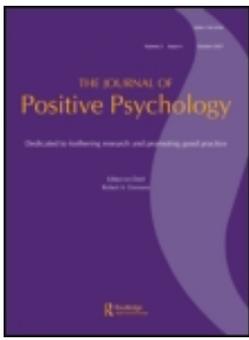
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## Mindfulness-based stress reduction effects on moral reasoning and decision making

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Previous research has demonstrated that mindfulness-based stress reduction (MBSR) improves psychological functioning in multiple domains. However, to date, no studies have examined the effects of MBSR on moral reasoning and decision making. This single group design study examined the effect of MBSR on moral reasoning and ethical decision making, mindfulness, emotion, and well-being. Additionally, we investigated whether there was an association between the amount of meditation practice during MBSR and changes in moral reasoning and ethical decision making, emotions, mindfulness, and well-being. Results indicated that MBSR was associated with improvements in mindful attention, emotion and well-being. Further, amount of meditation practice was associated with greater improvement in mindful attention. Two-month follow-up results showed that, MBSR resulted in improvements in moral reasoning and ethical decision making, mindful attention, emotion, and well-being. This study provides preliminary evidence that MBSR may potentially facilitate moral reasoning and decision making in adults.

**Keywords:** MBSR; morality; moral reasoning; ethics; mindfulness; moral decision making

### Introduction

There are few questions in psychology of greater social and global significance than how to cultivate moral development and ethics (Shapiro, 2009). Moral reasoning, the basis for ethical behavior, is crucial to individuals and society as a whole (Freedman, 2011). Moral reasoning is recognized as a process that evolves throughout the lifespan as a result of interactions with the environment (Kohlberg, 1976; Piaget, 1965). With each life experience, an individual's moral reasoning develops from tacit to explicit understanding (Narvaez, 2010). In turn, this understanding influences how one behaves in the world.

Given that central to the foundation of contemplative and meditative practices is the intention to develop ethical behavior, morality, and virtue (Shapiro, 2009), this study examines whether training in mindfulness facilitates ethical decision making. We hypothesize that the cultivation of mindfulness may be an important component of the ethical decision process. And yet, scarce extant research in the mindfulness literature has been devoted to the understanding and explicit cultivation of ethical behavior and moral reasoning.

Mindfulness refers to the awareness that arises when an individual intentionally attends to the present moment in an open and discerning way (Shapiro & Carlson, 2009). This awareness refers to both

awareness of one's interior landscape of emotions, cognitions, mind states, and externally to what is happening in one's environment and in relationship to others. Mindfulness may enhance ethical motivation and behavior through various means including increasing awareness (of self and other), reduction of problematic emotions and behaviors, strengthening of morality supporting qualities such as love, compassion, empathy, wisdom, and care, cultivating altruism, and disidentification with an egocentric perspective (re-perceiving) (Shapiro, 2009; Walsh, 1999). Preliminary empirical research supports the importance of mindfulness in ethical behavior and moral decision making. For example, Ruedy and Schweitzer (2010) found that individuals who are more mindful are more likely to act ethically, value upholding ethical standards, and use a principled approach to ethical decision making. Therefore, it is important to explore if training in mindfulness practice does indeed impact moral reasoning and ethical decision making.

### Mindfulness

Although mindfulness is a 2600-year-old practice, with roots in Buddhist meditation, it is a universally applicable practice, and a natural human capacity. Mindfulness is defined as the 'awareness that arises

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through intentionally paying attention in an open, kind and discerning way' (Shapiro & Carlson, 2009). Mindfulness involves being aware of what is arising without changing the experience, but rather changing the *relationship* to the experience (Kabat-Zinn, 1990, 1994). Mindfulness practices are designed to enhance awareness of thoughts, feelings, somatic sensations, intention/motivation, and behaviors. Research has shown that mindfulness skills have psychological and physiological benefits for clinical (e.g. pain, cancer, heart disease, depression, and anxiety) and nonclinical populations (Chambers, Gullone, & Allen, 2009; Grossman, Niemann, Schmidt, & Walach, 2004b). Psychological benefits include enhancement of cognition and creativity, attention and concentration, self-esteem, interpersonal functioning, self-view, and empathy. Physiological benefits include improvement in immune system functioning, modulation of cortisol, increased cerebral blood flow and shifts of activity of the two brain hemispheres, and increases in rapid eye movement sleep (Shapiro, Walsh, & Britton, 2003). Further, several meta-analyses have supported the notion that mindfulness training programs such as mindfulness-based stress reduction (MBSR; Kabat-Zinn, 1990) reduces symptoms of stress, anxiety, and depression, and enhances well-being across clinical and non-clinical samples (e.g. Baer, 2003b; Bishop, 2002; Grossman, Niemann, Schmidt, & Walach, 2004a; Jazaieri, Goldin, Werner, Ziv, & Gross, 2012).

### **Moral reasoning**

There is much debate as to whether ethics can be taught. Measuring a construct such as moral reasoning is a complex and controversial task because a person's ethical perspectives may be difficult to uncover for several reasons. For instance, it may be difficult to find out what a person's primary belief system is, since depending on the problem, a person may be led to different ethically oriented solutions. Second, ethical beliefs may be compartmentalized leading to different perspectives under different contexts. Third, behavior is not always consistent with espoused beliefs. Finally, the standards of ethical behavior (driven by social norms) that people hold are often dependent on the group of people they are applying it to (Drake, Hall, & Lang, 2011). Nevertheless, the ability to teach or enhance one's moral reasoning and ethical decision making behavior is an important question to address in our world today.

### **Mindfulness and moral reasoning**

The link between mindfulness (present moment attention) and moral reasoning (a cognitive developmental construct) is an important one to make. According to Rest (1983), there are four key components to moral

behavior: (1) moral sensitivity, (2) moral judgment, (3) moral motivation and commitment, and (4) moral motivation and moral character and competence. Rest (1983) defines moral sensitivity as the awareness a person has regarding their actions (or inactions) and the potential effects their behavior has on others (including the awareness that a situation has a moral component). Once there is awareness, moral judgment is the decision point of taking the morally best course of action. Moral motivation and commitment is the prioritization of moral values over one's own personal values. Finally, Rest (1983) indicated that moral motivation and moral character and competence are having the strength to follow through with the morally best course of action. The foundation of moral reasoning rests on awareness. Mindfulness helps one cultivate this *awareness*. Through *intentionally* attending to the present moment in an *open* (motivation and commitment) and *discerning* (judgment) way (Shapiro & Carlson, 2009), mindfulness practice helps cultivate all of the factors involved in moral reasoning. It is only through awareness that we have the opportunity for conscious choice.

In many contemplative traditions, the foundation of all meditation practices is training in moral reasoning and ethical decision making behavior. For example, in the Buddhist monastic tradition, ordained monks and nuns first study the *Vinaya Pitaka*, which contains the guidelines for both behaviors and mental attitudes that support a moral life. The cultivation of a moral life as a basis for the cultivation of mental qualities that arise from mindfulness training is implicit in MBSR training. This broader issue of the role of context in contemplative practice is an area for future inquiry. Nevertheless, strong arguments can be made that the cultivation of mindfulness without explicit training in ethics will have an impact on moral reasoning and decision making. For example, decision making in complex social interactions (in which habitual ego driven tendencies are typically present) is often directed towards self-serving biases and self-preservation. However, mindfulness practice aims at transforming those automatic habits of self-grasping or self-preservation. Thus, it cultivates a more objective, less ego-centric frame of reference, and develops the capacity to consider the well-being of others in addition to oneself. This is the foundation of moral decision making in contemplative practice.

Although there is a clear theoretical link between mindfulness and moral reasoning, few studies have examined the effects of contemplative practice on moral reasoning (Nidich, Ryncarz, Abrams, Orme-Johnson, & Wallace, 1983; Travis, Arenander, & DuBois, 2004), and there has been no empirical research on the effects of MBSR on ethical decision making. This preliminary study is an attempt to specifically address this gap.

Table 1. Demographics.

	MBSR <i>n</i> = 25
Females, <i>n</i> (%)	21 (84%)
Age (M years $\pm$ SD)	31.84 $\pm$ 9.88
Prior meditation practice, <i>n</i> (%)	19 (76%)
Ethnicity, <i>n</i> (%)	
Caucasian	17 (68%)
Asian	5 (20%)
Latino	2 (8%)
Pacific Islander	1 (4%)
Year in graduate school, <i>n</i> (%)	
First	3 (12%)
Second	4 (16%)
Third	14 (56%)
Fourth	1 (4%)
Religion, <i>n</i> (%)	
Christian	16 (64%)
Jewish	2 (8%)
None	6 (24%)
Sikhism	1 (4%)

### This study

The goal of the present preliminary study was to investigate the effects of MBSR training on four distinct domains of psychological functioning: moral reasoning and ethical decision making, mindfulness, and emotion, and well-being. We expected that MBSR would result in improved moral reasoning and decision making, mindfulness, improved (less negative and more positive) emotion, and well-being at immediately post-MBSR and at the two-month follow-up. Because some studies have found a relationship between amount of mindfulness practice and increases in mindfulness and well-being, we expected that meditation practice would be associated with improvements on all treatment outcome measures.

### Methods

#### *Participants and procedure*

Participants included 25 adults recruited from a graduate course at a local University (Table 1). Participants completed a battery of self-report measures at baseline (Time 1; *n* = 25), post-MBSR (Time 2; *n* = 25), and at a two-month follow-up (Time 3; *n* = 22). During MBSR, participants completed daily meditation monitoring diaries. All participants provided informed consent in accordance with Human Subjects guidelines.

### Intervention

#### *Mindfulness-based stress reduction*

MBSR training was delivered in an academic setting in a standard format based on a training protocol

developed by Kabat-Zinn (1990). Participation in the MBSR program consisted of eight weekly, two-hour sessions and a half-day retreat (total of 20 h). MBSR participants were also instructed to complete daily home practice based on audiotapes, and a daily monitoring diary of both formal and informal meditation practices. The course was led by a PhD-level clinical psychologist (Shauna Shapiro) with over a decade of experience teaching MBSR.

MBSR consists of didactic and experiential components designed to cultivate mindfulness skills. Participants received training in several mindfulness practices: (1) 'Sitting Meditation' involving awareness of body sensations, thoughts, and emotions while continually returning the focus of attention to the breath; (2) 'Body Scan', a progressive movement of attention through the body from toes to head observing any sensations in the different regions of the body; (3) 'Hatha Yoga', which consists of stretches and postures designed to enhance greater awareness of and to balance and strengthen the musculoskeletal system; and (4) Three-Minute Breathing Space, a 'mini-meditation' that focuses on the breath, the body and what is happening in the present moment (Segal, Williams, & Teasdale, 2002). Inherent in all these techniques is an emphasis on mindfulness, continually bringing attention to the present moment. In addition to the mindfulness exercises, a 'loving-kindness' meditation was introduced, in order to develop empathy and compassion for others and oneself.

### Measures

Participants completed self-report measures assessing moral reasoning, mindfulness, emotion, and well-being.

#### *Moral reasoning and ethical decision making*

The DIT-2 presents five moral dilemmas: (a) a father contemplates stealing food for his starving family from the warehouse of a rich man hoarding food; (b) a newspaper reporter must decide whether to report a damaging story about a political candidate; (c) a school board chair must decide whether to hold a contentious and dangerous open meeting; (d) a doctor must decide whether to give an overdose of pain-killer to a suffering but frail patient; and (e) college students demonstrate against US foreign policy. Participants are then asked to select the action that the respondent thinks the character in the story should take. Participants are also asked to rate the importance of the 12 statements of reasoning using a five-point Likert-type scale (i.e. from no importance to great importance). Finally, participants are asked to rank the top 4 most important statements (out of the 12)

involved in making a decision. By examining responses to the questions posed in these five short vignettes, an individual's moral reasoning is evaluated.

Two of the main developmental indices provided by the DIT-2 are a principled score (P-score) and a N2 score, which is the P-score adjusted for lower stage reasoning. Compared to the P-score, the N2 score demonstrates better construct validity (Rest, Thoma, Narvaez, & Bebeau, 1997). P-scores range from 0 to 95, a higher P-score/N2 score indicates higher-level moral reasoning and decision making. In this study, similar to others, the N2 score was examined. The instrument has demonstrated adequate test–rest reliability ( $\alpha$ 's 0.70–0.80) and discriminant validity (Rest, Narvaez, Thoma, & Bebeau, 1999). The DIT-2 was scored by the Center for the Study of Ethical Development at the University of Alabama ([www.centerforthestudyofethicaldevelopment.net](http://www.centerforthestudyofethicaldevelopment.net)).

### Mindfulness

Two measures were used to examine the construct of mindfulness. The *Five Facet Mindfulness Questionnaire* (FFMQ; Baer, 2003a), is a 39-item self-report measure which measures mindfulness, and includes five factors: observing, describing, acting with awareness, non-reactivity to inner experience, and non-judging of inner experience. Items are rated on a five-point Likert scale. The instrument has good internal consistency (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006). The *Mindful Attention Awareness Scale* (MAAS; Brown & Ryan, 2003), is a 15-item self-report measures which assesses internal and external mindfulness in everyday activities on a six-point Likert scale. The MAAS has demonstrated adequate psychometric properties (Brown & Ryan, 2003; Carlson & Brown, 2005).

### Emotion

*State-Trait Anxiety Inventory-Trait and State* (STAI-T; STAI-S; Spielberger, Gorsuch, & Lushene, 1970), is a 40-item self-report measure designed to study both state anxiety and trait anxiety. According to the authors, state anxiety is more transient, fluctuating over time, with varying intensity (how the person feels in the moment). While, trait anxiety is considered a predictor of stable individual differences in anxiety and how a person generally tends to respond when met with a perceived environmental threat. Items are rated on a four-point scale. The *Positive and Negative Affectivity Schedule* (PANAS; Watson, Clark, & Tellegen, 1988) is a 20-item instrument which assesses psychological well-being and distress on a seven-point Likert scale with higher levels, indicating greater positive and negative affects.

### Well-being

To further examine the impact of the intervention on other positive outcomes in addition to moral reasoning, measures of well-being were also assessed for exploration, including decentering/reperceiving, empathy, compassion, self-compassion, happiness, and stress.

The *Experiences Questionnaire* (EQ; Fresco et al., 2007), is a 20-item self-report measure designed to examine rumination and decentering or 'reperceiving'. Participants respond on a Likert scale to questions about life experiences. The *Interpersonal Reactivity Index* (IRI; Davis, 1980), is a 28-item self-report instrument that measures four psychological domains: perspective taking, fantasy, empathic concern, and personal distress. Responses are made on a five-point Likert scale (0 = does not describe me well to 4 = describes me very well). Higher scores correspond to greater levels of empathy. The *Santa Clara Brief Compassion Scale* (SCBCS; Hwang, Plante, & Lackey, 2008), is a brief version of Sprecher and Fehr's 2005 Compassionate Love Scale. This five-item measure is used to measure compassion for self and others and has adequate reliability. The *Self-Compassion Scale* (SCS; Neff, 2003), consists of 26 items and three subscales: self-kindness versus self-judgment, common humanity versus isolation, and mindfulness versus overidentification. Higher scores on the five-point scale indicate higher self-compassion. The *Subjective Happiness Scale* (SHS; Lyubomirsky & Lepper, 1999), is a four-item measure of happiness, measured on a six-point Likert scale. Two of the items ask participants to characterize their happiness relative to others, whereas the other two items offer brief descriptions and ask participants the extent to which each characterization describes them. The *Perceived Stress Scale* (PSS; Cohen, Kamarck, & Mermelstein, 1983), is a 10-item measure of the degree to which participants assess life events and situations as stressful over the past month. This is measured on a five-point Likert scale with higher scores indicating greater perceived stress. MBSR training has been shown to result in significant reductions on the PSS (Carmody, Reed, Merriam, & Kristeller, 2008).

### Mindfulness practice diaries

MBSR participants completed daily mindfulness practice diaries that were submitted on a weekly basis during the eight-week training. The purpose was to examine the effect of weekly practice on MBSR outcomes. Participants indicated the number of times and number of minutes of each mindfulness practice per week.

Table 2. Psychological measures at baseline and post-MBSR.

Measure	Baseline Mean (SD)	Post-MBSR Mean (SD)
Moral reasoning		
DIT N2 score	42.87 (12.78)	45.45 (16.89)
Mindfulness		
FFMQ	3.23 (0.39)	3.56 (0.30)
MAAS	3.70 (0.70)	3.99 (0.52)
Emotion		
STAI-S	41.60 (11.22)	31.00 (7.71)
STAI-T	41.83 (9.53)	35.17 (9.12)
PANAS Pos.	33.54 (5.21)	36.21 (4.09)
PANAS Neg.	23.63 (5.83)	19.71 (4.55)
Well-being		
EQ	31.95 (4.73)	25.82 (3.67)
IRI	3.68 (0.29)	3.65 (0.28)
SCBCS	5.43 (0.75)	5.78 (0.54)
SCS	2.85 (0.62)	3.41 (0.57)
SHS	4.76 (0.72)	5.18 (0.72)
PSS	19.54 (7.06)	13.63 (4.84)

Notes: M, mean; SD, standard deviation; effect size, partial  $\eta^2$ ; FFMQ, Five Factor Mindfulness Scale; MAAS, Mindful Attention Awareness Scale; STAI-S, State-Trait Anxiety Inventory (State); STAI-T, State-Trait Anxiety Inventory (Trait); PANAS Pos., Positive and Negative Affectivity Schedule (Positive); PANAS Neg., Positive and Negative Affectivity Schedule (Negative); EQ, Experiences Questionnaire; IRI, Interpersonal Reactivity Index; SCBCS, Santa Clara Brief Compassion Scale; SCS, Self-compassion Scale; SHS, Subjective Happiness Scale; PSS, Perceived Stress Scale; DIT N2 score, P score adjusted for lower stage reasoning.

### Statistical analysis

Data were analyzed with SPSS Version 17.0. One way repeated-measures analysis of variance (ANOVA) was used to examine change on measures of moral reasoning, mindfulness, emotion, and well-being for both immediate (baseline vs. post-MBSR) and longer-term (baseline vs. two-month follow-up) outcomes. For all analyses, effect size estimates are reported as partial eta squared ( $\eta_p^2$ ).

### Results

#### Moral development

One way repeated-measures ANOVA revealed no significant changes from baseline to post-MBSR on moral reasoning immediately ( $F_{1,24} = 1.14$ ,  $p > 0.30$ ,  $\eta_p^2 = 0.05$ ; Table 2). However, there was a significant increase from baseline to two-month follow-up ( $F_{1,21} = 5.24$ ,  $p < 0.03$ ,  $\eta_p^2 = 0.20$ ; Table 3).

#### Mindfulness, emotion, and well-being

##### Immediate effects

One way repeated-measures ANOVA from baseline to post-MBSR yielded significant improvements on all

Table 3. Psychological measures at baseline and two-month post-MBSR.

Measure	Baseline Mean (SD)	Two-month post-MBSR Mean (SD)
Moral reasoning		
DIT N2 score	42.80 (12.52)	48.23 (13.82)
Mindfulness		
FFMQ	3.17 (0.38)	3.55 (0.25)
MAAS	3.72 (0.73)	4.07 (0.54)
Emotion		
STAI-S	41.95 (11.42)	36.74 (10.77)
STAI-T	41.13 (9.89)	37.19 (9.10)
PANAS Pos.	33.52 (5.38)	34.95 (4.25)
PANAS Neg.	23.57 (5.84)	18.90 (5.58)
Well-being		
EQ	31.95 (4.96)	28.45 (4.45)
IRI	3.67 (0.31)	3.57 (0.35)
SCBCS	5.50 (0.77)	5.37 (0.94)
SCS	2.89 (0.63)	3.31 (0.55)
SHS	4.86 (0.72)	5.14 (0.89)
PSS	20.19 (7.00)	15.00 (5.43)

Notes: M, mean; SD, standard deviation; effect size, partial  $\eta^2$ ; FFMQ, Five Factor Mindfulness Scale; MAAS, Mindful Attention Awareness Scale; STAI-S, State-Trait Anxiety Inventory (State); STAI-T, State-Trait Anxiety Inventory (Trait); PANAS Pos., Positive and Negative Affectivity Schedule (Positive); PANAS Neg., Positive and Negative Affectivity Schedule (Negative); EQ, Experiences Questionnaire; IRI, Interpersonal Reactivity Index; SCBCS, Santa Clara Brief Compassion Scale; SCS, Self-Compassion Scale; SHS, Subjective Happiness Scale; PSS, Perceived Stress Scale; DIT N2 score, P score adjusted for lower stage reasoning.

measures of *mindfulness* (FFMQ:  $F_{1,24} = 21.07$ ,  $p < 0.001$ ,  $\eta_p^2 = 0.47$  and MAAS:  $F_{1,24} = 4.33$ ,  $p < 0.05$ ,  $\eta_p^2 = 0.15$ ) and all measures of *emotion* (STAI-S:  $F_{1,19} = 25.19$ ,  $p < 0.001$ ,  $\eta_p^2 = 0.57$ , STAI-T:  $F_{1,17} = 10.49$ ,  $p < 0.005$ ,  $\eta_p^2 = 0.38$ , PANAS positive:  $F_{1,23} = 8.06$ ,  $p < 0.009$ ,  $\eta_p^2 = 0.26$ , and PANAS negative:  $F_{1,23} = 14.07$ ,  $p < 0.001$ ,  $\eta_p^2 = 0.38$ ). Significant improvements were found on *well-being* measures of EQ ( $F_{1,21} = 43.43$ ,  $p < 0.001$ ,  $\eta_p^2 = 0.67$ ), SCBCS ( $F_{1,23} = 5.63$ ,  $p < 0.03$ ,  $\eta_p^2 = 0.20$ ), SCS ( $F_{1,21} = 26.28$ ,  $p < 0.001$ ,  $\eta_p^2 = 0.56$ ), SHS ( $F_{1,19} = 5.79$ ,  $p < 0.03$ ,  $\eta_p^2 = 0.23$ ), and PSS ( $F_{1,23} = 22.37$ ,  $p < 0.001$ ,  $\eta_p^2 = 0.49$ ). The IRI was non-significant ( $F_{1,24} = 0.40$ ,  $p > 0.54$ ,  $\eta_p^2 = 0.02$ ). All pre- and post-MBSR means for all variables are reported in Table 2.

#### Longer-term effects

One way repeated-measures ANOVA from baseline to two-month follow-up yielded significant improvements on both measures of *mindfulness*: FFMQ ( $F_{1,20} = 26.07$ ,  $p < 0.001$ ,  $\eta_p^2 = 0.57$ ) and MAAS ( $F_{1,21} = 5.77$ ,  $p < 0.03$ ,  $\eta_p^2 = 0.22$ ). For *emotion* measures, significant improvements were found on the PANAS

negative ( $F_{1,20} = 20.03, p < 0.001, \eta_p^2 = 0.50$ ). Though non-significant, trend level improvement was seen on the STAI-S ( $F_{1,18} = 4.11, p > 0.06, \eta_p^2 = 0.19$ ), STAI-T ( $F_{1,15} = 3.91, p > 0.06, \eta_p^2 = 0.21$ ), and PANAS positive ( $F_{1,20} = 3.23, p < 0.09, \eta_p^2 = 0.14$ ). For well-being measures, significant improvements were found on the EQ ( $F_{1,19} = 9.11, p < 0.007, \eta_p^2 = 0.32$ ), SCS ( $F_{1,19} = 9.41, p < 0.006, \eta_p^2 = 0.33$ ), and PSS ( $F_{1,20} = 22.13, p < 0.001, \eta_p^2 = 0.53$ ). Non-significant findings were found for the IRI ( $F_{1,21} = 2.81, p > 0.11, \eta_p^2 = 0.12$ ), SCBCS ( $F_{1,20} = 67, p > 0.42, \eta_p^2 = 0.03$ ), and SHS ( $F_{1,18} = 3.36, p > 0.08, \eta_p^2 = 0.16$ ). All pre- and two-month follow-up means for all variables are reported in Table 3.

**Meditation practice effects**

MBSR participants reported spending an average of 309.04 minutes per week (SD = 53.60) of mindfulness practice during on average 15.16 times per week (SD = 2.03). In minutes, the most common weekly practice reported was sitting meditation ( $M = 86.35$  minutes,  $SD = 59.15$ ), followed by body scan ( $M = 86.16$  minutes,  $SD = 49.56$ ), informal practice ( $M = 75.08$  minutes,  $SD = 56.13$ ), and finally mindful movement ( $M = 61.45$  minutes,  $SD = 49.55$ ). The most frequently practiced weekly mediation was informal practice ( $M = 4.35$  times per week,  $SD = 2.31$ ), followed by sitting meditation ( $M = 4.2$  times per week,  $SD = 1.83$ ), body scan ( $M = 3.67$  times per week,  $SD = 1.79$ ), and finally mindful movement was the least practiced weekly mediation ( $M = 2.95$  times per week,  $SD = 2.20$ ). The amount of meditation practice was associated with mindfulness (MAAS) at the two-month follow-up ( $r(22) = 0.55, p < 0.01$ ), but not with any other measure at either post-MBSR or two-month post-MBSR (Figure 1).

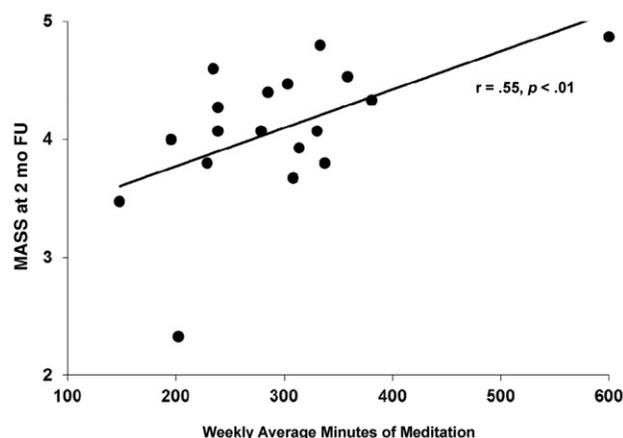


Figure 1. MAAS measured at two-month follow-up and weekly average minutes of meditation practice.

**Relationship between mindfulness and moral reasoning, emotion, and well-being measures**

For changes from pre-to-post-MBSR, the FFMQ were correlated with change scores on the MAAS, STAI-S, STAI-T, PANAS positive and negative, and SCS; and the MAAS was correlated with the FFMQ, STAI-T, and PANAS positive and negative. For changes from pre-to-2mo-post-MBSR, the FFMQ was correlated with the MAAS, PANAS positive and EQ; and the MAAS was correlated with the FFMQ and EQ (Table 4).

**Discussion**

The primary goal of this study was to investigate the effects of MBSR training on four domains: moral reasoning, mindfulness, emotion, and well-being. Compared to interpersonal communication training, MBSR was hypothesized to produce a significant improvement on moral decision making, greater mindfulness, and improved emotion and well-being at post-training and at the two-month follow-up. Second, it was hypothesized that the amount of mindfulness practice in the MBSR group would also be related to positive training outcome in all four domains.

In support of our primary hypothesis, results suggested MBSR was associated with immediate post-training improvements on mindfulness (FFMQ and MAAS), emotion (STAI-S, STAI-T, and PANAS), and well-being (EQ, SCBCS, SCS, SHS, and PSS). There was no change in moral reasoning at post-training. However, at the two-month follow-up, MBSR training was associated with improvements in

Table 4. Mindfulness change scores correlated with moral reasoning, emotion and well-being change scores at baseline to post-MBSR and baseline to two-month post-MBSR.

MBSR change scores	Baseline to post-baseline to two-month change score		FU change scores	
	FFMQ	MAAS	FFMQ	MAAS
FFMQ	–	0.61**	–	0.58**
MAAS	0.61**	–	0.58**	–
DIT N2	0.21	–0.05	0.11	–0.04
STAI-S	0.75**	0.37	0.18	0.19
STAI-T	0.58**	0.54**	0.25	0.21
PANAS positive	0.61**	0.42*	0.48*	0.26
PANAS negative	0.83**	0.26	0.05	0.15
EQ	0.32	0.27	0.54*	0.56**
IRI	0.32	–0.01	0.15	–0.06
SCBCS	0.32	–0.01	0.33	0.01
SCS	0.47*	0.16	0.33	0.01
SHS	–0.22	–0.20	0.18	0.07
PSS	–0.36	–0.03	–0.01	0.15

Note: \* $p < 0.05$  and \*\* $p < 0.01$ .

all four domains – moral reasoning and decision making (DIT-2), mindfulness (FFMQ, MAAS), emotion (PANAS), and well-being (EQ, SCS, and PSS).

One possible explanation why significant results on moral reasoning was found at the two-month follow-up, and not immediately post-intervention, is that mindfulness training is a skill developed through practice. Thus, perhaps as one practices, the skill is strengthened and greater improvements (such as increases in moral reasoning) are seen. Initial research suggests there is a relationship between meditation practice and scores on moral reasoning (Nidich et al., 1983; Travis et al., 2004). Further, this ‘delayed trajectory’ was seen in a randomized controlled trial by Davidson and colleagues (2003) who found MBSR had a greater benefit at the four-month follow up compared to the post-assessment. Because ethical behavior and moral maturity are developmental in nature, it is hypothesized that with continued practice, greater benefits would be seen. Further research is needed in order to examine the relationship between mindfulness practice and moral reasoning.

It is interesting to note that improvements made on the mindfulness domain when measured by the FFMQ and MAAS held constant at post-MBSR and at the two-month follow-up (pre- to post-MBSR:  $p < 0.001$  and pre- to two-month follow-up:  $p < 0.05$ ). These findings provide support for the claim (Shapiro, Brown, & Biegel, 2007; Shapiro, Carlson, Astin, & Freedman, 2006) that mindfulness is a central feature of MBSR and is related to the positive outcomes of the program, even when measured longitudinally.

In partial support of our secondary hypothesis, we found a relationship between mindfulness practice in the MBSR group and greater mindfulness as measured by the MAAS at the two-month follow-up. However, amount of practice was not associated with the other domains of moral reasoning, emotion, or well-being. The importance of home meditation practice has been well-documented in treatment manuals and research studies with both clinical and non-clinical populations; however, the results of the benefits of practice have been mixed (Carmody & Baer, 2008). Some studies have found a benefit of more mindfulness practice (e.g. Carmody & Baer, 2008; Carson, Carson, Gil, & Baucom, 2004; Jha, Stanley, Kiyonaga, Wong, & Gelfand, 2010; Kristeller & Hallett, 1999; Shapiro, Bootzin, Figueredo, Lopez, & Schwartz, 2003; Specia, Carlson, Goodey, & Angen, 2000) while others have not (e.g. Astin, 1997; Davidson et al., 2003; Shapiro et al., 2007). The correlation between greater amount of mindfulness practice and improvement on outcome measures is consistent with what others have found. Carmody and Baer (2008) examined amount of meditation practice and found that it was significantly related to mindfulness. This study also found that mindfulness as measured by the FFMQ and MAAS

was related to baseline to post-MBSR and baseline to two-month follow-up change scores in several areas of emotion and well-being; however, changes in mindfulness were not related to the changes seen on moral reasoning at two-month follow-up. Given the emphasis of out-of-class practice in treatment manuals for mindfulness interventions, the association between the amount of mindfulness practice performed and outcome measures is an important area to continue to explore, particularly when examining moral reasoning.

### Limitations and directions for future research

There were several limitations of this research study, in turn suggesting possibilities for future research. First, this was the first study to examine MBSR and moral reasoning and included measures across time, however, the lack of a randomized control comparison group prevents from making overly strong conclusions from these results. Because morality and ethics are not constructs explicitly linked to mindfulness, this may be less problematic. Nevertheless, future research employing a formal randomized controlled trial examining moral reasoning within MBSR is needed to make stronger inferences. This study examined the N2 score on the DIT, which is one aspect of moral phenomena. Future research should examine other aspects including moral sensitivity, moral motivation, as well as schema level DIT data.

This study relied solely on self-report of all constructs. Previous (non-MBSR) studies have attempted to examine the effects of short (10 minutes) mindfulness-type interventions on affective reactions to dynamic stimuli (Erisman & Roemer, 2010), while others have used EEG to examine the relationship between frontal coherence and outcomes such as moral reasoning, emotional stability, inner orientation, and state and trait anxiety (Travis & Arenander, 2006). Previous MBSR studies have examined the neural effects of MBSR training on emotional reactivity using functional magnetic resonance imaging (fMRI). Goldin and Gross (2010)'s fMRI study found MBSR training to be associated with a reduction in brain responses to anxiety inducing stimuli in brain regions implicated in self-reflection and increased responses in parietal and occipital brain regions associated with attentional engagement (Goldin & Gross, 2010).

There is a need for behavioral assessment which can measure the constructs influenced by MBSR training. Although it is commendable that the area of neuroscience is starting to examine moral reasoning (and in particular empathy) and the specific neural circuitry involved with morality (Decety, Michalska, & Kinzler, 2011), future research should examine non-invasive methods of examining the benefits of MBSR practice and its relationship with moral reasoning,

beyond self-report. Further, although this study followed participants for two months after the training, future research would also benefit from including longer follow-up assessments to determine whether the effects of the training is sustained. Given that the moral reasoning finding in this study was absent immediately post-MBSR but present at the two-month follow-up, future research must include prospective longitudinal study designs.

A final limitation of this study was the small ( $n=25$ ) and homogeneous sample size (primarily Caucasian women). Although no evidence for gender differences has been reported in the past, it is possible that men and women may respond to or retain the effects of MBSR differently. Future research may also benefit from exploring the effects of MBSR on specific populations such as medical students, or those pursuing degrees in business or law. Essentially, larger and more diverse sample sizes are needed to test the reliability of the results found in this study, particularly for moral reasoning since after all, 'it is much easier to be moral if one's life is secure in some way, and much more difficult to refrain from stealing if one's children or parents are hungry' (Salzberg, 1995, p. 114). Given that many MBSR programs have been conducted in prisons throughout the United States (e.g. Himelstein, 2011; Samuelson, Carmody, Kabat-Zinn, & Bratt, 2007), examining any changes in moral reasoning among this population following MBSR interventions could be telling. In general, the relationship between existing psychological and behavioral interventions and moral reasoning and ethical behavior should be further examined.

It should be noted that this course introduced the loving-kindness meditation along with MBSR. According to a recent meta-analysis, Sedlmeier et al. (2012) found that different meditation practices can influence effects. Future studies may examine the potential confounding effects of loving-kindness meditation on moral reasoning and ethical behavior. Further, future research may benefit from comparing mindfulness-based intervention to different interventions, which share the goal of moral reasoning. For example, the Eight Point Program (Oman & Thoresen, 2003), based on spiritual modeling of deeply moral and inspiring spiritual leaders (e.g. Mother Mary, Jesus, Buddha, Mother Theresa, Martin Luther King), or compassion cultivation training programs (Jazaieri, Jinpa, et al., 2012), this will help determine the specific mediating effects of mindfulness, as well as help elucidate other mechanisms helpful in cultivating moral reasoning.

In addition, it will be interesting to examine if there are different ways of teaching mindfulness (other than through MBSR) which can more effectively increase moral reasoning and ethical behavior. The way mindfulness is taught in Western traditions is distinctly

different from how it was original conceived – raising the question of the importance of context. For example, traditionally, meditation (Pali: *Jhana*; Sanskrit: *Dhyana*) was taught as part of a larger frame which included explicit teachings and practices of ethical behavior (Pali: *Sila*; Sanskrit: *Śīla* or 'moral virtue' or 'moral discipline'), as well as teachings on generosity (Pali/Sanskrit: *Dana*). Meditation, moral discipline, and giving comprise of the three principal 'bases of merit' (Bodhi, 2005, p. 4). In attempt to more closely align with the original form in which mindfulness meditation was taught, an innovative mindfulness-based program was developed, which explicitly introduces ethical behavior and morality in the intervention (e.g. Monteiro & Musten, 2009). The current MBSR program, which was the one used in this research study, does not explicitly address issues of ethics or morality. Future research will benefit from comparing an 'ethically-based mindfulness intervention' to the traditional MBSR program, to determine differential effects.

Another area of future study is to determine mechanisms of action for cultivating ethical decision making. For example, specific to this study, how does mindfulness shape and determine ethical decision making? There are numerous reasons why contemplative practices may have an impact on moral reasoning. Below we highlight four possible mechanisms for future exploration.

### **Reperceiving**

Mindfulness enhances our capacity to shift from our subjective, personal perspective to a more objective, witness-like perspective. Interestingly, when people are faced with a challenging ethical dilemma, if the dilemma is perceived as personal and then the central portions of the brain associated with emotion are active. In contrast, when individuals contemplated more impersonal, indirect situation, portions of the brain associated with stored memory and reflective cognition showed increased relative activation (Greene, Sommerville, Nystrom, Darley, & Cohen, 2001). Thus, our ethical decision making process, when personal is typically driven by emotional intuitions, however, these can be modified and brought into more conscious awareness and reflection, by taking a more objective approach to the situation. One of the central features of mindfulness practice, is this capacity to shift perspective from subject to object, whereby experience becomes less personal and subjective, allowing the practitioner to see with greater clarity and objectivity. This shift in perspective has been termed reperceiving. Preliminary empirical evidence demonstrates that mindfulness meditation significantly increases one's

ability to re-perceive (Orzech, Shapiro, Brown, & McKay, 2009).

### ***Enhanced empathy and compassion***

Some have suggested that the emotion of compassion is the source of one's moral judgment (Goetz, Keltner, & Simon-Thomas, 2010; Haidt, 2003; Nussbaum, 1996, 2001). Given that morality is based on the judgment of behaviors as either 'right' or 'wrong', compassion acts across multiple domains and serves as a 'moral barometer' (McCullough, Kilpatrick, Emmons, & Larson, 2001) which often results in diminished punitive tendencies (Rudolph, Roesch, Greitemeyer, & Weiner, 2004). Another reason mindfulness may increase moral reasoning is through its cultivation of compassion and empathy (Kristeller & Johnson, 2005). There is ample empirical evidence that mindfulness increases compassion and empathy. It has been suggested that through helping one disidentify with a subjective, ego-centered perspective, mindfulness helps practitioners to see another's perspective and to cultivate greater empathy and compassion (Shapiro & Izett, 2008).

### ***Values clarifications***

Value issues are often seen as problematic in Western scientific traditions since modernist theory viewed science as objectively neutral (Shapiro & Carlson, 2009). However, there are always values driving behavior, so it is not a question of whether values are operating but how and to what extent we can bring these values to consciousness so that they can guide our ethical decision making and behaviors. Mindful practice may help us in several ways: (a) bring unconscious/nonconscious values to awareness; (b) decide whether they are really the values we want to pursue – are they wholesome, or merely biologically reflexive or culturally conditioned; (c) develop wholesome and skillful values and to decrease unwholesome ones (Shapiro & Carlson, 2009). Mindfulness offers a universally applicable system of ethics based on inquiry and the ability to discern wholesome from unwholesome. This *ethics as inquiry* (Wallace & Shapiro, 2006) simply inquires into, 'what is most conducive to my own and others well being?' Future research could benefit by explore values clarification and its impact on ethical decision making.

### ***Emotion and emotion regulation***

The nonjudgmental awareness one cultivates through mindfulness practice has been associated with an enhanced ability to engage with emotions, and fully experience and express emotions, without pushing them away, or holding onto them (see review in

Chambers et al., 2009). This emotional awareness that is cultivated through mindfulness practice is essential in the context of morality and ethics – as one's experience of emotion is an important component of one's beliefs about the moral acceptability of an action (e.g. Haidt, 2001). Recent preliminary research has even suggested that closing one's eyes (a behavior often done while practicing mindfulness) while engaging with mentally stimulating events has a systematic effect on one's response to an ethical situation – making moral judgments more extreme and encouraging ethical rather than unethical behavior (Caruso & Gino, 2011).

Within the context of regulating emotions, research has shown that meditation practice decreases emotion reactivity and increases emotion regulation (Goldin & Gross, 2010). Empirical evidence lends support to this theory, demonstrating that mindfulness has been positively associated with adaptive emotion regulatory strategies such as emotional awareness, acceptance, and letting go of negative thoughts. Further, mindfulness has been negatively associated with maladaptive emotion regulatory strategies such as thought suppression, rumination, impulsivity, and passivity (e.g. Baer et al., 2006; Brown & Ryan, 2003; Feldman, Hayes, Kumar, Greeson, & Laurenceau, 2007; Frewen, Evans, Maraj, Dozois, & Partridge, 2008; McKee, Zvolensky, Solomon, Bernstein, & Leen-Feldner, 2007). Given the evidence that many ethical and moral decisions are highly impacted by emotion, it seems probable that greater skill at navigating emotions, will lead to greater moral reasoning and decision making. As Narvaez (2010) states, 'emotions highlight some details over others, narrow options, and make salient particular courses of action', highlighting the powerful ability of emotions to influence behaviors, and moral reasoning and ethical behavior.

### **Conclusion**

This study was the first of its kind to examine the outcome of moral reasoning and ethical decision making with respect to MBSR. We believe that examining the long-term effects of mindfulness training on moral reasoning and ethical decision making is an important area for future research. As we emerge into a global community faced with unprecedented challenges, it is essential to explore ways of increasing moral reasoning and decision making. It is hoped this study will encourage future research to continue the investigation of the potential of mindfulness to increase moral and ethical behavior.

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