Compassionate Hearts Protect Against Wandering Minds: Self-compassion Moderates the Effect of Mind-Wandering on Depression

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Abstract
Depression is associated with high levels of mind-wandering and low levels of self-compassion. However, little is known about whether and how these two factors interact with one another to influence depressive symptoms. The current study examined the interaction between mind-wandering, self-compassion and depressive symptoms in a depressed sample and tested the effects of an eight-week Mindfulness Based Cognitive Therapy (MBCT) program on these constructs. At baseline, mind-wandering was associated with higher depressive symptoms only among individuals with low self-compassion. Self-compassion additionally predicted depressive improvement. As expected, MBCT increased self-compassion and reduced mind-wandering compared to a treatment-as-usual control group. Overall, longitudinal changes in self-compassion produced a moderation effect similar to the one at baseline so that increases in mind-wandering were associated with increases in depressive symptoms only among those who decreased in self-compassion. Results provide the first evidence that self-compassion can protect against the deleterious effects of mind-wandering among depressed participants, both at baseline and longitudinally. Findings also suggest that self-compassion is an effective predictor of depressive improvement. Finally, MBCT is effective not only at reducing depressive symptoms, but also at targeting protective and risk factors associated with depression.

Keywords
Depression; mind-wandering; self-compassion; Mindfulness Based Cognitive Therapy

Introduction
People spend almost half of their waking hours mind-wandering rather than focused on their current activity or surroundings (Killingsworth & Gilbert, 2010). Mind-wandering has been described as the interruption of task-focus by task-unrelated-thought (Mrazek, Phillips, Franklin, Broadway, & Schooler, 2013; Smallwood & Schooler, 2013), and associated with increased depressive symptoms (Deng, Li, & Tang, 2014; Killingsworth & Gilbert, 2010; Ottaviani et al., 2015; Stawarczyk, Majerus, & D’Argembeau, 2013; Watts, MacLeod, &

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Morris, 1988). In contrast, self-compassion is linked to decreased depressive symptoms and higher levels of resilience and well-being (Barnard & Curry, 2011; Ehret, Joormann, & Berking, 2015; Krieger, Altenstein, Baettig, Doerig, & Holtforth, 2013; MacBeth & Gumley, 2012; Van Dam, Sheppard, Forsyth, & Earleywine, 2011; Wang, Lin, & Pan, 2015). Self-compassion is described as “being open to and moved by one’s own suffering, experiencing feelings of caring and kindness toward oneself, taking an understanding, nonjudgmental attitude toward one’s inadequacies and failures, and recognizing that one’s own experience is part of the common human experience” (Neff, 2003a, pp.224). Very little is currently known about whether and how self-compassion and mind-wandering interact with one another over the course of treatment for depression and the potential impact of this interaction on longitudinal change in depressive symptoms. Such an interaction may better inform clinicians about potential mechanisms of depressive improvement and help optimize treatment programs for depression. The current study aims to examine whether self-compassion influenced the relationship between mind-wandering and depressive symptoms in a depressed sample as well as to test the effects of Mindfulness Based Cognitive Therapy (MBCT; Segal, Williams, & Teasdale, 2012) for depression on these constructs.

A 2010 report concluded that “a wandering mind is an unhappy mind” (Killingsworth & Gilbert, 2010). The study followed 2250 adults through 22 different activities, and found that people were less happy when their minds wandered. Mind-wandering to happy topics did not increase happiness compared to focusing on the current activity. These findings complement other findings that indicate a bi-directional relationship between mind-wandering and negative moods in which mind-wandering leads to a negative mood, which can in turn increase the mind’s tendency to wander, creating a reinforcing cycle (Deng et al., 2014; Mrazek, Phillips, et al., 2013; Ottaviani et al., 2015; Stawarczyk et al., 2013; Watts et al., 1988). Although mind-wandering is associated with certain benefits such as improved future planning and creative problem solving (Mooneyham & Schooler, 2013), it has been found to be overall detrimental to physical health (Epel et al., 2013; Ottaviani, Shapiro, & Couyoumdjian, 2013) and to desensitize one’s perception of the discomfort of others (Kam, Xu, & Handy, 2014; see also Jazaieri et al., 2016). Importantly, depressed individuals spend more of their time mind-wandering, and tend to wander more to negative, maladaptive and self-critical topics which may perpetuate depression (Carver & Ganellen, 1983; Hoffmann, Banzhaf, Kanske, Bermpohl, & Singer, 2016; Marchetti, Koster, Klinger, & Alloy, 2017). While this increased mind-wandering may include depressive rumination, during which individuals focus on their distress and its possible causes and consequences in a rigid and repetitive way (Nolen-Hoeksema, 1991), it is not limited to such rumination, and may include other forms of thought, including non-ruminative depression-related thinking (Killingsworth & Gilbert, 2010). Given the frequency and negative valence of mind-wandering among depressed individuals, there is a clear need to help reduce mind-wandering among this population.

Conversely, self-compassion has a positive effect on mood and depression. Self-compassion consists of three components: self-kindness, common humanity, and mindfulness. Self-compassion has been shown to effectively increase depression resilience (Ehret et al., 2015; Ford, Klibert, Tarantino, & Lamiis, 2017; Krieger et al., 2013; Neff & Vonk, 2009; Raes, 2010; Svendsen, Kvernenes, Wiker, & Dundas, 2017; Wang et al., 2015). A meta-analysis of
14 studies found a large effect size for the relationship between compassion and psychopathology and concluded that compassion is an important explanatory variable in understanding mental health and resilience to conditions such as depression and anxiety (MacBeth & Gumley, 2012).

While current evidence suggests that mind-wandering and depressive symptoms positively co-vary and self-compassion and depressive symptoms inversely co-vary, very little is known about the interaction between these factors. An intervention that could impact these constructs and help elucidate their interrelation could be of great value in the management of depression. We seek to determine whether MBCT, a treatment program for depression, could benefit depressed individuals by impacting on mind-wandering, self-compassion, and depressive symptoms.

MBCT is a structured eight-week intervention combining mindfulness and meditative practices with elements of cognitive therapy for depression (Segal et al., 2012; Shapero, Greenberg, Pedrelli, de Jong, & Desbordes, 2018). There is considerable evidence demonstrating MBCT’s efficacy in preventing depressive relapse (Kuyken et al., 2016; Piet & Hougaard, 2011) and reducing depressive symptoms (Geschwind, Peeters, Huibers, Van Os, & Wichers, 2012; Greenberg, Shapero, Mischoulon, & Lazar, 2016; Hofmann, Sawyer, Witt, & Oh, 2010; Kingston, Dooley, Bates, Lawlor, & Malone, 2007). Two of the most basic principles emphasized in MBCT are keeping attention focused on the experience of the present moment, and adopting an accepting and non-judgmental attitude (Segal et al., 2012). These principles of present-moment attention and non-judgmental acceptance directly relate to the concepts of mind-wandering and self-compassion. Accumulating evidence supports the effects of MBCT on self-compassion (Kuyken et al., 2010a; Melyani, Allahyari, Falah, Ashtiani, & Tavoli, 2015; Rimes & Wingrove, 2011; van der Velden et al., 2015). There is some evidence regarding the effect of mindfulness based interventions on mind-wandering (Mrazek, Franklin, Phillips, Baird, & Schooler, 2013), although the specific effects of MBCT on mind-wandering are yet to be conclusively established.

In the current study, our overarching hypothesis is that self-compassion would protect against the deleterious effects of mind-wandering on depressive symptoms. To test this, we examined the relationship between mind-wandering, self-compassion and depressive symptoms both at baseline and longitudinally, and tested the effect of MBCT on changes in these constructs. Consistent with previous research, we hypothesized that higher levels of mind-wandering and lower levels of self-compassion will be associated with depressive symptoms. However, we further hypothesized a protective influence of self-compassion on the relationship between mind-wandering and depressive symptoms so that baseline levels of mind-wandering would be associated with increased depressive symptoms at baseline only among those low in self-compassion, and that baseline levels would predict longitudinal depressive improvement. Finally, we hypothesized that MBCT would effectively reduce mind-wandering and improve self-compassion compared to a control group receiving treatment as usual, and that overall longitudinal improvements in self-compassion would moderate the relationship between changes in mind-wandering and changes in depressive symptoms.
Methods

Participants

A total of 52 participants were recruited from the Massachusetts General Hospital in addition to physician referrals, mailing lists, flyers and clinicaltrials.gov postings. Participants were screened for mild to severe depressive symptoms, designated by a score of ≥11, indicating at least mild depression, on the 28-item Hamilton Depression Scale (HAM-D-28). This cutoff was chosen to obtain a full extent of depressive symptom severity in accordance with a recent focus on a spectrum of diagnoses found in the DSM (APA, 2013). Additional inclusion criteria included age between 18 and 65 years, dysphoria or low mood for a minimum of two months prior, no prior experience with systematic mindfulness programs including MBCT, no psychotic features, and no suicidal attempts in the past six months (see Greenberg et al., 2016; Shapero, Greenberg, Mischoulon, et al., 2018 for further details about this sample). Participants with a history of substance dependence or abuse were excluded because of the complicated nature of dual diagnosis treatment (Quello, Brady, & Sonne, 2005) and the need for modified mindfulness-based training programs with such populations (Grant et al., 2017). Antidepressant doses were required to be stable for a minimum of 6 weeks prior to the start of the study.

A final sample of 40 participants were assigned to MBCT + treatment-as-usual (TAU) or waitlist + TAU (Figure 1). Treatment-as-usual was defined as ongoing, unchanged medication or individual therapy and was received by both groups in addition to the study intervention. Waitlisted participants were offered the MBCT program after the conclusion of their participation in the study. The first 13 participants were quasi-randomized in the order of their enrollment, with the first group of 8 assigned to MBCT and the second group of 5 assigned to the waitlist. This quasi-randomization was not based on any demographic or clinical measures and has been used in previous mindfulness studies (Dimidjian et al., 2014; Grossman, Tiefenthaler-Gilmer, Raysz, & Kesper, 2007; Hölzel et al., 2011). Due to an increase in recruitment, the next 27 participants were fully randomized after completion of their baseline testing. Fourteen were randomized to MBCT and 13 were randomized to the waitlist. The 40 enrolled participants showed a range of depressive symptoms from mild to severe, with the BDI-II showing a normal distribution at baseline. The scores ranged from 11–42 and were distributed among four severity levels of Minimal (0–13) = 5, Mild (14–19) = 12, Moderate (20–28) = 13, and Severe (29–63) = 10 depressive symptoms.

Overall, 22 participants were assigned to the MBCT group and 18 were waitlisted. Groups did not statistically differ in age (t(38)=0.69, p=.55), gender, Major Depressive Disorder (MDD) diagnosis, or co-morbidity with anxiety disorders (minimal p =.26; Fischer’s exact test; Table 1). Furthermore, groups did not differ in ongoing treatment-as-usual in terms of antidepressant use or psychotherapy treatment (See Table 1; Shapero, Greenberg, Mischoulon, et al., 2018 for more details). A Mann-Whitney test further indicated the MBCT group and the Wait-List group did not differ in education level (U = 68, p=.82; Table 1). Although a current diagnosis of MDD was not a specific inclusion criteria in order to examine a range of severity of depression, 82% of participants met the full criteria based on the Mini International Neuropsychiatric Interview (MINI; Sheehan et al., 1997).
Procedure

At the baseline visit, participants signed the consent form and underwent the clinician-rated Mini International Neuropsychiatric Interview (MINI) and HAM-D-28 to determine eligibility. Eligible participants then completed measures of self-compassion and mind-wandering, as well as other measures outside the scope of this paper (Greenberg et al., 2016; Shapero, Greenberg, Mischoulon, et al., 2018). Beck’s Depression Inventory-II (BDI-II; Beck, Steer, & Brown, 1996), a self-reported measure of depressive symptoms, was completed 0–2 weeks before the start of the program and every 2–3 weeks during the program. Testing procedures, with the exception of the MINI, were repeated for all participants 0–3 weeks after the MBCT program for all participants. Assessors were blind to group assignment for all randomized participants. The study was approved by the Massachusetts General Hospital’s Institutional Review Board and registered at clinicaltrials.gov (NCT02457936).

Mindfulness Based Cognitive Therapy Program

The MBCT program consisted of eight weekly 2-hour sessions and followed the guidelines of Segal, Williams and Teasdale (2012), combining elements of cognitive therapy and experiential meditation exercises. These sessions were led by two MBCT teachers having 8–13 years of experience teaching mindfulness-based group programs. Each session consisted of didactic content, which followed the session outline closely, in combination with discussing participants’ experiences encountered in the moment. The curriculum included psychoeducation about depression, mindful breathing exercises, mindfully exploring bodily sensations (“body scan”), walking meditation, mindful eating, attending thoughts mindfully, and gentle yoga exercises. In between sessions, participants were asked to practice these skills and complete practice logs. The teachers were blinded to the study hypotheses and the group assignment (i.e. whether participants were on the waitlist before the MBCT program).

Measures

Depressive Symptoms.—For the eligibility screen, psychiatrists and psychologists administered the Mini International Neuropsychiatric Interview (MINI) version 5.0.0 and the 28-item Hamilton Rating Scale for Depression (HAM-D-28; Hamilton, 1960). Massachusetts General Hospital clinicians hold regular re-training sessions to ensure inter-rater reliability, which produce internal produced internal consistencies of 0.7–0.8. The MINI is a widely used, standardized psychiatric interview instrument and was utilized to ensure no participants met the clinical exclusionary criteria (see Participants section). The HAM-D-28 is a well-validated clinician-rated diagnostic interview which assesses the severity of depressive symptoms from “normal” to “very severe depression”. Consistent with previous studies that defined “remission” as a score of 0–10 on the HAM-D-28 (e.g., Kayser et al., 2015; Schlaepfer et al., 2008), the minimum cutoff for this study was 11 which indicated mild depression. Since up to eight weeks could have passed between the screening visit and the beginning of the program, the HAM-D-28 that was administered at the visit was primarily used as a screening tool. The BDI-II, which was administered 0–2 weeks before the beginning of the MBCT program, was the primary depressive symptom measure for this study (Greenberg et al., 2016; Shapero, Greenberg, Mischoulon, et al., 2018).
administering the BDI-II closer to the beginning of the program than the HAM-D-28, it more accurately reflected potential changes in depressive symptoms during the course of the intervention. No enrollment decisions utilized the BDI-II. The BDI-II is a well validated, self-reported 21-item measure of depression with high internal consistency ($\alpha=0.92$ for outpatients; Beck et al., 1996).

**Self-Compassion.**—The Self-Compassion Scale (SCS; Neff, 2003b) is a 26-item self-reported scale that asks participants to rate statements on a scale of 1 (Almost Never) to 5 (Almost Always) based on how participants typically act towards themselves in difficult times. It is the most widely used measure to assess self-compassion (Neff, 2016). The SCS includes items such as “I’m disapproving and judgmental about my own flaws and inadequacies” and “When I’m feeling down I tend to obsess and fixate on everything that’s wrong”. The SCS has 6 subscales describing self-kindness, self-judgment, common humanity, isolation, mindfulness and over-identification. A total self-compassion score is calculated by adding the scores of the sub-scales together after reverse-scoring the negative aspects. The SCS has a demonstrated a test-retest validity of $\alpha = 0.93$.

**Mind-wandering.**—The Mind-Wandering Questionnaire (MWQ; Mrazek, Phillips, et al., 2013) is a 5-item self-reported scale that asks participants to rate statements on a 6-point Likert scale from 1 (Almost Never) to 6 (Almost Always). This measure captures trait levels of mind-wandering, defined as the interruption of focus on a specific task by task-unrelated thought, distinct from day-dreaming (Mrazek, Phillips, et al., 2013). It focuses on the frequency of lapses in attention rather than the specific content to which the mind has wandered to. Items include statements such as “While reading, I find I haven’t been thinking about the text and must therefore read it again” and “I do things without paying full attention”. The MWQ has a demonstrated internal validity of $\alpha = 0.85$.

**Analytic Plan**

We first assessed whether groups significantly differed in baseline characteristics. The correlation between baseline outcome measures was then examined. To test the hypothesized role of self-compassion as a moderator of the relationship between mind-wandering and depressive symptoms at baseline, we conducted a moderation analysis with a follow-up simple slope analysis. Gender was controlled for in analyses including self-compassion due to common gender differences in the self-compassion scale and related constructs such as self-criticism and interdependent vs. dependent sense of self (Cross & Madson, 1997; Leadbeater, Kuperminc, Blatt, & Hertzog, 1999; Neff, 2003a). Change scores in the outcome measures were then calculating by subtracting post-program values from baseline values, and their correlations with each other reported. The degree to which baseline levels of self-compassion predicted improvement in depressive symptoms was assessed using linear regression. Differences in the effects of MBCT vs. the control group on mind-wandering and self-compassion were assessed via Analysis of Covariance (ANCOVA) with group as the independent variable and post-program values as the dependent variables, while covarying baseline outcome measure values. To examine whether changes in self-compassion impacted the relationship between changes in mind-wandering and depressive symptoms over time,
we ran a moderation analysis similar to that conducted at baseline level, but with change scores from baseline to prospective assessment.

**Results**

**Preliminary Analysis**

Participant flow is detailed in Figure 1. Twelve participants (6 of each group) withdrew from the study prior to conclusion of post-program testing. Of the 28 remaining participants, eight did not complete the post-program SCS and two did not complete the post-program MWQ. Comparisons between completers in the final pre-post analyses versus those who withdrew or had missing data, revealed no significant differences in baseline SCS, MWQ or BDI-II scores (maximal $t(36)=1.09$, $p=.28$). Participants in the MBCT group who were included in the longitudinal analysis attended an average of 7 classes (Range: 6–8; All greater than what has been considered the minimally adequate dose (4 sessions) in previous research; Ma & Teasdale, 2004). Participants reported practicing MBCT skills and exercises an average of 80 times ($SD=55.09$). Overall, baseline mind wandering data were analyzed from 38 participants (22 MBCT) and self-compassion data from 37 participants (20 MBCT). Pre-post mind wandering data were analyzed from 25 participants (15 MBCT) and self-compassion from 18 (11 MBCT) participants (see Figure 1).

**Relationship between Measures at Baseline**

Higher baseline BDI-II depression scores were significantly correlated with the HAMD ($r=0.54$, $p=.001$), the MWQ ($r=.45$, $p=.005$), and the SCS ($r=-.47$, $p=.004$) so that individuals with more severe depressive symptoms also had higher mind-wandering scores and lower self-compassion scores. Moreover, higher levels of baseline self-compassion were significantly correlated with lower mind-wandering ($r=-.45$, $p=.005$).

To investigate whether self-compassion moderated the relationship between mind-wandering and depressive symptoms, we conducted a moderation analysis utilizing an SPSS macro (Process) (Hayes, 2013). The main predictors of self-compassion and mind-wandering were mean centered as outlined by Aiken and West (1991). The regression analysis supported the hypotheses that self-compassion moderated the relationship between mind-wandering and depressive symptoms (Beta = −.03, $t = 2.07$, $p=.047$, $\Delta R^2 = .09$). To examine the form of the interaction, follow-up analyses examined the simple slopes at one standard deviation above and below the centered mean (Aiken & West, 1991). Analysis revealed that the slope was significant only for low self-compassion ($t = 2.85$, $p=.007$) and not for high self-compassion ($t = 0.223$, $p=.824$). As seen in Figure 3a, when individuals had high levels of self-compassion, the levels of mind-wandering did not differ in their relation to depressive symptoms. However, when individuals had low levels of self-compassion, mind-wandering differentially related to depression so that lower levels of mind-wandering were associated with lower depressive symptoms and higher levels of mind-wandering were associated with higher depressive symptoms.
Prediction of Depressive Improvement

To test the hypothesis that baseline levels of self-compassion would predict longitudinal depressive improvement, a linear regression model was constructed with changes in BDI-II scores as the dependent variable, predicted by baseline SCS levels and gender (see Analytic Plan). The model was found to be significant ($F(2,23)=4.71, p=.019$) with higher levels baseline self-compassion significantly predicting longitudinal reduction in depressive symptoms ($\beta=0.54, p=.008$; Figure 2). The multiple correlation coefficient was 0.54 indicating that the model explained 29.1% of the variance in change in depressive symptoms ($R=.539, R^2=.291$).

Effects of MBCT

The two groups, MBCT versus Waitlist, did not differ in baseline SCS, MWQ or BDI-II scores, or in any other of the clinical or demographic variables (Table 1).

Mind-wandering.—A one way ANCOVA applied to post-program MWQ scores with Group as the independent variable while controlling for baseline MWQ scores revealed that following MBCT training, the MBCT group exhibited lower mind-wandering than the control group ($F(1,21)=7.00, p=.015; \eta^2=0.25$; Table 2; Figure 4).

Self-compassion.—An ANCOVA applied to post-program SCS total scores with Group as the independent variable while controlling for baseline SCS total scores and gender revealed that the MBCT group exhibited higher self-compassion than the control group ($F(1,14)=13.75, p=.002; \eta^2=0.495$; Table 2; Figure 5) following MBCT training. Similar ANCOVAs on each of the SCS subscales revealed that MBCT exhibited significantly higher levels of Common Humanity ($F(1,14)=12.12, p=.004; \eta^2=0.464$), Mindfulness ($F(1,14)=12.87, p=.003; \eta^2=0.479$) and Over-Identification ($F(1,14)=21.16, p<.001; \eta^2=0.60$). No significant group differences were found in Self-Kindness, Self-Judgement, or Isolation (Maximal $F=3.13, p=.099$).

Relationship between Changes in Outcome Measures

Changes in BDI-II scores correlated with changes in the HAMD ($r=.53, p=.017$), changes in SCS ($r=-.65, p=.005$) as well as with changes in the MWQ ($r=.51, p=1.14$) so that reductions in depressive symptoms were associated with increases in self-compassion and reductions in mind-wandering.

To investigate whether changes in self-compassion impacted the relationship between changes in mind-wandering and in depressive symptoms, we again conducted a moderation analysis utilizing an SPSS macro (Process) and covaried gender. The regression analysis supported the hypotheses that changes in self-compassion impacted the relationship between changes in mind-wandering and in depressive symptoms ($Beta=.098, t=2.34, p=.037, \Delta R^2 = .163$). To examine the form of the interaction, follow-up analyses examined the simple slopes at one standard deviation above and below the centered mean (Aiken & West, 1991). Analysis revealed that the slope was just-significant only for individuals whose self-compassion increased ($t = 2.11, p=.05$) and not for those whose self-compassion decreased ($t = 0.86, p=.403$). As seen in Figure 3b, when individuals had increases in self-compassion,
changes in mind-wandering were not differentially associated with changes in depressive symptoms. However, when individuals decreased in self-compassion, those who also decreased in mind-wandering improved in depressive symptoms, whereas those who increased in mind-wandering showed a trend of a worsening in depressive symptoms. We further tested whether group influenced the moderating influence of self-compassion on the relationship between mind-wandering and depressive symptoms. The three-way interaction was not significant (Beta = −.18, t = 0.84, p=.42, ∆ R^2 = .017). This suggests that the moderation was found as a whole for the entire sample, beyond the specific effects of MBCT.

**Discussion**

This study set out to examine whether self-compassion is protective against the deleterious effect of mind-wandering on depressive symptoms in a sample of depressed participants, and test the effect of MBCT on these constructs. Greater depressive severity was associated with higher levels of mind-wandering and lower levels of self-compassion. Moreover, self-compassion moderated the effects of mind-wandering on depressive symptoms at baseline such that mind-wandering was associated with higher depressive severity only among individuals with low self-compassion. Self-compassion additionally predicted depressive improvement. As expected, MBCT increased self-compassion and reduced mind-wandering compared to a treatment-as-usual control group. Overall, longitudinal changes in self-compassion produced a moderation effect similar to the one at baseline so that increases in mind-wandering were associated with increases in depressive severity only among those who decreased in self-compassion. Previous findings demonstrated a well-established link between mind-wandering and depressive symptoms (Deng et al., 2014; Killingsworth & Gilbert, 2010; Ottaviani et al., 2015; Stawarczyk et al., 2013; Watts et al., 1988). The current findings suggest that self-compassion helps protect depressed individuals against these deleterious effects of mind-wandering on depressive symptoms.

Depression has long been associated with a negative view of the self, harsh self-criticism, and self-blame (Beck, Rush, Shaw, & Emery, 1979; Blatt, Quinlan, Chevron, McDonald, & Zuroff, 1982; Carver & Ganellen, 1983). Self-compassion plays a significant role in these processes, leading some to conceptualize depression as a compassionate deficit (Allen & Knight, 2005). One important way in which self-compassion may help protect against depression is by strengthening self-kindness, which has been regarded as the opposite end of the spectrum with regards to the way individuals treat and approach themselves (Neff, 2003a). Self-compassion may thereby pacify self-criticism and blame while facilitating a more caring, understanding, and supportive stance towards oneself (Ehret et al., 2015; Ford et al., 2017).

The protective effect of self-compassion coupled with the finding that self-compassion predicted depressive improvement over time emphasizes the importance of self-compassion in resilience and alleviation of depression, and supports findings of previous studies (Barnard & Curry, 2011; Ehret et al., 2015; Krieger et al., 2013; MacBeth & Gumley, 2012; Van Dam et al., 2011; Wang et al., 2015). Several important clinical implications stem from this finding. First, measures of self-compassion may be used to predict clinical prognosis.
and chances of recovery in depression. Additionally, the moderating role of self-compassion suggests a novel potential mechanism of depressive improvement. This supports the potential benefit of MBCT and other treatment programs that show promise with regards to their effect on self-compassion, including short-term dynamic therapy (Schanche, Stiles, McCullough, Svanberg, & Nielsen, 2011) as well as treatments in which compassion is the main program focus such as Compassion Focused Therapy (Gilbert, 2012), Attachment-Based Compassion Therapy (Navarro-Gil et al., 2018), and Compassionate Mind Training (Gilbert & Procter, 2006). Moreover, adopting a self-compassionate attitude may also be better emphasized in other therapeutic programs as a means to alleviate depressive symptoms and guard patients against the deleterious effects of their mind’s increased predisposition to wander (Hoffmann et al., 2016).

Our findings that MBCT significantly improved self-compassion and reduced mind-wandering compared to the control group, coupled with our findings that MBCT reduces depressive symptoms (Greenberg et al., 2016) converge with previous findings (Kuyken et al., 2010b, 2016; Melyani et al., 2015; Piet & Hougaard, 2011; Rimes & Wingrove, 2011; van der Velden et al., 2015; Wells et al., 2013) and suggest that MBCT does not only target depression. It specifically reduces mind-wandering while also potentially reducing its harmful effects via increases in self-compassion, a resilience factor predictive of depressive improvement. This may provide tentative support for the use of MBCT for conditions such as attention deficit disorders (Schoenberg et al., 2014; Semple, Lee, Rosa, & Miller, 2010), which are characterized by high degrees of mind-wandering, and have an elevated co-morbidity rate with depression (Biederman, Newcorn, & Sprich, 1991; Knouse, Zvorsky, & Safren, 2013). It is possible that the improvements in mind-wandering and self-compassion observed in the current study are a direct result of the emphasis MBCT places on present moment awareness, acceptance, and non-judgement, although further investigation is needed in order to pinpoint the precise related mechanisms specific to MBCT.

Many religions and theological traditions emphasize compassion as a core value and milestone on one’s spiritual path (Gilbert & Gilbert, 2015). Self-compassion is a particular case of such compassion, in which being touched by suffering, being open to it, and having a desire to alleviate it are directed towards one’s own suffering rather than that of others’. Self-compassion not only shares similar beneficial outcomes as spiritual experiences do, such as social support, life satisfaction, happiness, and optimism, but also has also been found to predict spiritual experiences (Akin & Akin, 2017). Given the link between self-compassion and spirituality, understanding how self-compassion can be increased, as done in the current study, may potentially shed light on the broader workings of spiritual processes.

A few limitations of the study should be taken into account when considering our results. First, the sample size was small, due in part to attrition levels, primarily in the longitudinal analyses. A small sample, however, primarily limits statistical power and is therefore more problematic with regards to “missed” effects (type II error) than with regards to the significant effects found. To help minimize attrition, future studies may implement study-attrition prevention strategies such as providing material incentives for study completers, communicating the importance of follow-up testing to participants, as well as strategies...
Additionally relevant to keeping patients in treatment such as using reminder emails and phone calls, rapid follow-up of missed appointments, and early detection of factors which may interfere with treatment retention and follow-up participation (Zweben, Fucito, & O’Malley, 2009). A second limitation of this study is reliance mostly on self-reported measures, which are subjective. Third, the MBCT group received an active intervention compared to the control group, which received treatment as usual. This enables the attribution of the results to the MBCT program as a whole rather than to specific components of it such as group and teacher support. Finally, although group assignment for most participants was random, the first few participants were quasi-randomized by enrollment order. The latter two limitations concerning the control group and randomization, however, primarily relate to the specific effects of MBCT rather than our findings regarding the baseline and longitudinal relationship between mind-wandering, self-compassion, and depressive symptoms. Due to these limitations, the current results should be taken as preliminary evidence, in need of future validation by studies with larger samples and active control groups.

**Conclusion**

This study was the first to demonstrate that self-compassion can provide protection against the deleterious effects of mind-wandering on depressive symptoms among depressed participants, both at baseline and longitudinally. Findings additionally suggest that self-compassion is an effective predictor of depressive improvement, and that MBCT is effective not only at reducing depressive symptoms, but also at targeting protective and risk factors associated with depression. This adds to the growing body of literature supporting self-compassion as a crucial factor for flourishing and well-being, and emphasizes the importance of directly addressing and facilitating self-compassion in treatments for depression.

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Figure 1.
Participant flow (modified from Greenberg et al., 2017)
Figure 2.
Baseline self-compassion values predict longitudinal depressive improvement
The relationship between baseline self-compassion and longitudinal change in depressive symptoms while controlling for gender ($\beta=0.54$, $p=0.008$)
Figure 3.
Moderation effects of self-compassion on the relationship between mind-wandering and depressive symptoms (A) at baseline (B) longitudinally. Change in BDI-II scores here is post minus pre so that negative change scores indicate reductions in depressive symptoms.
Figure 4.
ANCOVA of post-program mind wandering scores, adjusted for baseline scores. $F(1,21)=7.00, p=.015; \eta_p^2=0.25$. Error bars represent standard errors.
Figure 5.
ANCOVA of post-program self-compassion scores, adjusted for baseline scores and gender. 
\( F(1, 14) = 13.75, p = .002; \eta_p^2 = 0.495 \). Error bars represent standard errors.
**Table 1.**

Baseline demographics and clinical information by group

<table>
<thead>
<tr>
<th></th>
<th>MBCT n = 22</th>
<th>Wait-List n = 18</th>
<th>Comparison</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>59%</td>
<td>67%</td>
<td>p = .43</td>
</tr>
<tr>
<td>Age (Mean, SD)</td>
<td>39.77 (10.6)</td>
<td>36.89 (15.83)</td>
<td>p = .55</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td>p = .82</td>
</tr>
<tr>
<td>No College Degree</td>
<td>11%</td>
<td>25%</td>
<td></td>
</tr>
<tr>
<td>College Degree</td>
<td>56%</td>
<td>25%</td>
<td></td>
</tr>
<tr>
<td>Graduate Degree</td>
<td>35%</td>
<td>44%</td>
<td></td>
</tr>
<tr>
<td>Major Depressive Disorder</td>
<td>86%</td>
<td>77%</td>
<td>p = .38</td>
</tr>
<tr>
<td>Anxiety Disorder</td>
<td>50%</td>
<td>50%</td>
<td>p = .62</td>
</tr>
<tr>
<td>GAD</td>
<td>32%</td>
<td>31%</td>
<td>p = .64</td>
</tr>
<tr>
<td>SAD</td>
<td>16%</td>
<td>12%</td>
<td>p = .56</td>
</tr>
<tr>
<td>Panic/Agoraphobia</td>
<td>5%</td>
<td>18%</td>
<td>p = .26</td>
</tr>
<tr>
<td>PTSD</td>
<td>5%</td>
<td>0%</td>
<td>p = .53</td>
</tr>
</tbody>
</table>

Note: The age comparison utilized an independent t-test, the education comparison utilized a Mann-Whitney test, and the rest of the variables utilized the Fischer exact test.
### Table 2.

Main study variable comparison by group

<table>
<thead>
<tr>
<th></th>
<th>MBCT</th>
<th>Wait-List</th>
<th>Group Comparison</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre</td>
<td>Post</td>
<td>Pre</td>
</tr>
<tr>
<td>HAM-D</td>
<td>22.80 (8.62)</td>
<td>12.65 (8.48)</td>
<td>24.00 (6.34)</td>
</tr>
<tr>
<td></td>
<td>12.65 (8.48)</td>
<td>24.00 (6.34)</td>
<td>21.00 (6.55)</td>
</tr>
<tr>
<td>BDI-II</td>
<td>23.60 (7.08)</td>
<td>12.23 (8.67)</td>
<td>22.18 (9.39)</td>
</tr>
<tr>
<td></td>
<td>12.23 (8.67)</td>
<td>22.18 (9.39)</td>
<td>26.33 (16.09)</td>
</tr>
<tr>
<td>SCS</td>
<td>67.30 (13.82)</td>
<td>83.77 (15.48)</td>
<td>62.12 (19.90)</td>
</tr>
<tr>
<td></td>
<td>83.77 (15.48)</td>
<td>62.12 (19.90)</td>
<td>52.00 (13.23)</td>
</tr>
<tr>
<td>MWQ</td>
<td>20.41 (3.96)</td>
<td>17.43 (3.48)</td>
<td>19.75 (5.52)</td>
</tr>
<tr>
<td></td>
<td>17.43 (3.48)</td>
<td>19.75 (5.52)</td>
<td>20.00 (5.78)</td>
</tr>
</tbody>
</table>

Note:

* $p < .05$

** $p < .01$

Group comparisons at Pre are independent sample $t$ - tests and group comparisons presented at Post are ANCOVA $F$ values. Post scores are mean (rather than adjusted) values. Standard Deviations are shown in parentheses.