Evaluating the immediate impacts of brief mindfulness versus lovingkindness meditation

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Evaluating the immediate impacts of brief mindfulness versus lovingkindness meditation.

by

Jamie R. Forsyth

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Abstract

Although meditation has been around for centuries, it’s only recently that the utility of such an ancient practice has gained popularity within Western psychology. A vast body of literature supports the notion that meditation can have important impacts on suffering and psychopathology; however, few studies have evaluated differential effects between various forms of meditation. The aims of this study are threefold: 1) to determine if a brief meditation can have immediate effects on an individuals’ mood, 2) to determine the validity of two different types of meditations (mindfulness and lovingkindness) and 3) to evaluate the differential efficacy of the two types of meditation, specifically, whether one is more effective than the other. 179 undergraduate students who were mostly novice meditators participated in the current study. Results demonstrated that both meditations were equally effective at decreasing anxiety and depressive cognitions after only one 15-minute meditation session. Additionally, both meditations demonstrated increases in self-reported self-compassion and mindfulness. Finally, it seems that breathing meditation may be more beneficial for novice meditators and that lovingkindness meditation may have the biggest effect when taught after one has been introduced to the basic mindfulness technique.
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Introduction

“The cacophony of horror, pain, and judgment is overwhelming [our] ability to find peace and purpose. The human mind did not evolve for such a situation. Language evolved in a cooperative context, but its usefulness as a problem solving tool has so fed prediction, categorization, and judgment that people are beginning to think of life itself as a problem to be solved rather than a process to be lived.” - (Hayes, Pistorello, Levin, 2013, p. 17)

We have entered into an age where our minds are being constantly stimulated by various forms of media. We are a connected species, but one connected mostly to what we see on iPads, phones, the internet, and TV. In moments, we can hear about the latest bombings in the Middle East, crimes in our local neighborhood, and about our best friend’s wedding. We are bombarded by language, judgments, happiness, and pain. Horrors and atrocities from around the world are at our fingertips waiting to be viewed, read, and discovered. Social media has become the new way to stay connected with everyone in your life and is the primary place to find out how great the lives of your friends really are.

Harriet Goldhor Lerner has said “only through our connectedness to others can we really know and enhance the self.” Although we are more “connected” to friends, family, and information than ever before, rates of psychopathology have not declined. Advances in technology have afforded us many luxuries and numerous advantages over our ancestors. Given that, we would expect to see an increase in overall well being across the human race, but we know that this is not the case. In 2005, the National Comorbidity Study claimed that 46.4% of the American adult population would meet criteria for a mental disorder at some point in their lifetime (Kessler, Berglund, Demler, Jin, Merikangas, & Walters, 2005). A more recent survey of American adolescents demonstrated somewhat alarming findings: 49.5% of the adolescents surveyed met lifetime prevalence for any disorder (Merikangas et al, 2010). More specifically,
college counseling centers across the country are noticing a sharp increase in the severity and number of college students receiving services. Ninety percent of college counseling directors reported an increase in overall mental health concerns with a three-fold increase in mental health crises (i.e. suicidality, self-injury, hospitalizations, etc.) since the mid-1990’s (Gallagher, 2011). Furthermore, the percentage of students presenting to college counseling centers with complaints related to depression, suicidality, and personality disorders has at least doubled from 1993-2003 (Benton, Robertson, Tseng, Newton, & Benton, 2003).

We have more chronically ill, more medications, and more mental illness diagnoses than ever before. Even if technology isn’t solely responsible for these increases, it is important to take into consideration the effect it is having on our overall mental health and to recognize that we now are able to live in a sea of language – language that communicates messages like “the world is a scary place” and “why aren’t you as happy as all your friends?” Never before have we as a species been exposed to mass destruction and violence on such a large scale. Not only are we able to receive this information, but we can do so almost instantaneously through technology. Worry, fear, self-comparison can be manifested with the touch of a finger. As the founder of the Wisdom 2.0 conference, Soren Gordhammer, so eloquently states, “What the culture is craving is a sense of ease and reflection, of not needing to be stimulated or entertained or going after something constantly. Nobody’s kicking out technology, but we have to regain our connection to others and to nature or everybody loses” (Hochiman, 2013). The question becomes, in a constant barrage of language and judgments, how do we find peace of mind? How do we cultivate our own sense of security and calm when everything is so fast paced?

Within this consistent bombardment of language and media, it becomes increasingly difficult for us to stay in the present moment. Every time we access a news article or a Facebook
post, we are pulled out of the present and usually what follows is a trip into the past or future: “What if that earthquake strikes my town?” “Joe’s new girlfriend isn’t as pretty – maybe I wasn’t smart enough for him?” The more we are pulled out of the present, the more difficult it will be for us to come back to the present and experience life as it is being lived in this moment. A recent study discovered that “a wandering mind is an unhappy mind” and that our minds spend a significant amount of time wandering between the past and future. They also noted that mind wandering was the direct cause of unhappiness and not a consequence of unhappiness (Killingsworth & Gilbert, 2010). It seems that one way to maximize overall sense of well being and happiness would be to learn how to keep the mind from wandering. Thankfully, mystics, scholars, and religious personnel have known the solution to this problem for thousands of years.

**Meditation**

Some of the oldest written records of meditation practices date back to 1500 BCE (Everly & Lating, 2002). Meditation is broadly defined as “continued or extended thought; reflection; contemplation” (dictionary.com). Nevertheless, meditation is considered to be an umbrella term which houses many different forms underneath it. There are as many different types of meditation as there are religious practices in the world, and possibly even more. Some of the most popular meditation techniques include Zen meditation (a focus on nothingness), transcendental meditation (a focus on a mantra), mindfulness meditation (focus on the breath, emotions, physical sensations, etc. with the aid of a meditation guide), and lovingkindness meditation (focus on extending loving thoughts to yourself and others). Recently, researchers have begun to question whether all meditations are created equal. One study revealed that the two most popular meditation techniques are mantra and mindfulness and that preferences in meditation technique differed by age, with younger individuals preferring mindfulness (Burke,
The study also concluded that the trendiest meditation may not be the best meditation for you and that people were more likely to benefit from meditations they enjoyed and felt connected to (Burke, 2012). Additional research claims that the intention of the practitioners greatly affects the outcome of the meditation (Shapiro, 1992) which seems to suggest that expectancies play an important part in outcomes.

**Limitations of the current meditation literature.** Interestingly, although we know that meditation can be helpful and that different meditations may have varying levels of effectiveness based on the individuals participating in them, very little research has evaluated the differential effects of the various forms of meditation. Moreover, the research that has been conducted has been highly criticized. The most prominent criticisms have been directed at the methodological shortcomings of the research that has been conducted on meditation to date. Problems such as lack of control groups, small sample sizes, lack of randomization, and, most importantly, use of a waitlist control group are abundant within the meditation literature (Chiesa & Malinowski, 2011; Chiesa & Serretti, 2010). Further criticisms of the use of waitlist control groups include the inability of these studies to determine specific and nonspecific effects of the meditation practices in question (Chiesa & Malinowski, 2011). Therefore, it remains unclear as to whether an attribute such as mindfulness is the actual active ingredient or whether some nuance related to the actual meditation being conducted is responsible for the change experienced as a result of a meditation exercises.

**Mindfulness**

Mindfulness is considered to be one of the most popular meditation techniques to be used by Western psychologists in clinical practice and has been growing in popularity since the mid-1990’s (Dryden & Still, 2006). John Kabat-Zinn has been credited with providing the most
commonly accepted definition of mindfulness: “paying attention on purpose, in the present moment, and nonjudgmentally, to the unfolding of experience moment to moment.”

Mindfulness is a practice that trains the mind to focus on the present moment and helps cultivate the ability to live fully in the present. There are thousands of ways to practice mindfulness with the most common being listening to a guided meditation that instructs one to focus on the breath and maintain attention on the breath no matter what thoughts or feelings show up. Other practices include focusing the attention on specific body parts, smells, sounds, or emotions. Mindfulness can be practiced with everything from food and music to playdough. Mindfulness has been gaining much more attention over the past few decades and the interest in this practice has grown tremendously. Much of this interest is due to the ever expanding number of scientific studies that have shown mindfulness to have the beneficial outcomes people have been claiming it to have for thousands of years.

Benefits of mindfulness. Mindfulness, a once relatively unknown practice, is now being taught to children, high ranking executives in major corporations, and celebrities. The popularity of mindfulness seems to have been fueled by studies which demonstrate the wide reaching benefits of the practice. In fact, there have been so many studies conducted to date, that summarizing the entire literature is well beyond the scope of this study. It has even been suggested that the field has become saturated with review articles demonstrating the effectiveness of mindfulness (Hofmann, Sawyer, Witt, & Oh, 2010). For example, since 2010, there have been at least seven meta-analyses written on just the effectiveness of mindfulness for depression and anxiety (Chiesa & Serretti, 2011; Hoffman et al., 2010; Klainin-Yobas, Cho, & Creedy, 2012; McCarney, Schulz, & Grey, 2012; Piet & Hougaard, 2011; Strauss, Cavanagh, Oliver, & Pettman, 2014; Vollestad, Nielsen, & Nielsen, 2011). In 2014, meta-analyses were
published showing the effectiveness of mindfulness for various conditions including vascular disease (Abbott et al., 2014), chronic pain (Song, Lu, Chen, Geng, Wang, 2014), stress-related outcomes (Goyal et al., 2014), telomerase functioning which is associated with health and mortality (Schutte & Malouff, 2014), and gastrointestinal disorders (Aucoin, Lalonde-Parsi, & Cooley). Overall, practicing mindfulness can produce changes in awareness, attention, and emotion which can be measured subjectively, behaviorally, and neurobiologically (Keng et al., 2011).

**Emotional/psychological benefits.** Some of the emotional and/or psychological benefits of practicing mindfulness include increases in feelings of self-control (Bishop et al., 2004; Masicampo & Baumeister, 2007), affect tolerance (Fulton, 2005), enhanced flexibility (Adele & Feldman, 2004), emotional intelligence (Walsh & Shapiro, 2006), emotion regulation (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006; Corcoran, Farb, Anderson, & Segal, 2010; Farb et al., 2007; Lykins & Baer, 2009; Siegel, 2007), positive affect (Brown & Ryan, 2003; Erisman & Roemer, 2010; Jha, Stanley, Kiyonaga, Wong, Gelfand, 2010), overall rating of well-being (Carmody & Baer, 2008; Lykins & Baer, 2009; Ortner, Kiner, & Zelazo, 2007), quality of life (Grossman et al., 2004), life satisfaction (Brown & Ryan, 2003), agreeableness (Thompson & Waltz, 2007), conscientiousness (Giluk, 2009; Thompson & Waltz, 2007), vitality (Brown & Ryan, 2003), self-esteem (Brown & Ryan, 2003; Rasmussen & Pidgeon, 2010), empathy (Dekeyser, Raes, Leijssen, Leysen, Dewull, 2008), sense of autonomy (Brown & Ryan, 2003), competence (Brown & Ryan, 2003), optimism (Brown & Ryan, 2003), and self-compassion (Lykins & Baer, 2009).

Additionally, practicing mindfulness has been shown to decrease rumination (Chambers, Lo, & Allen, 2008; Lykins & Baer, 2009; McKim, 2008; Raes & Williams, 2010; Ramel,
Goldin, Carmona, & McQuaid, 2004), psychological distress (McKim, 2008; Coffey & Hartman, 2008; Ostafin, Chawla, Bowen, Dillworth, Witkiewitz, & Marlatt, 2006), depressive symptomology (Brown & Ryan, 2003; Cash & Whittingham, 2010; Grossman, Niemann, Schmidt, & Walach, 2004; McKim, 2008; Hofmann et al., 2010), depression associated with chronic medical conditions such as cancer and depressed clients labeled as “treatment resistant” (Hofmann et al., 2010), anxiety (McKim, 2008; Hofmann et al., 2010; Grossman et al., 2004), social anxiety (Brown & Ryan, 2003; Dekeyser et al., 2008; Rasmussen & Pidgeon, 2010), negative affect (Erisman & Roemer, 2010; Jha et al., 2010), reactivity (Cahn & Polich, 2009; Goldin & Gross, 2010; Ortner et al., 2007; Siegel, 2007), neuroticism (Dekeyser et al., 2008; Giluk, 2009), dissociation (Baer et al., 2006; Walach, Buchheld, Buttenmuller, Kleinknecht, Schmidt, 2006), experiential avoidance (Baer, Smith, & Allen, 2004), alexithymia (Baer et al., 2004), delusional intensity when in a psychotic state (Chadwick, Hember, Symes, Peters, Kuipers, & Dagnan, 2008), general psychological symptoms (Baer et al., 2006; Lykins & Baer, 2009), and fear of emotion (Lykins & Baer, 2009).

**Cognitive benefits.** Engaging in a mindfulness practice is also related to various cognitive benefits including improvements in objectivity (Adele & Feldman, 2004; Brown, Ryan, & Creswell, 2007; Leary & Tate, 2007; Shapiro, Carlson, Astin, & Freedman, 2006), improved concentration & mental clarity (Young, 1997), working memory capacity (Jha et al., 2010), cognitive flexibility (Moore & Malinowski, 2009), increased information processing speed (Moore & Malinowski, 2009), ability to let go of negative thoughts (Frewen, Evans, Maraj, Dozois, & Partridge, 2008), attention (Hodgins & Adair, 2010; Schmertz, Anderson, & Robins, 2009), and persistence (Evans, Baer, & Segerstrom, 2009). Decreases in task effort (Lutz, Slagter, Rawlings, Francis, Greischar, & Davidson, 2009), thoughts that are not related to
the task at hand (Lutz et al., 2009), absent-mindedness (Herndon, 2008), cognitive reactivity (Raes, Dewulf, Van Heeringen, Williams, 2009), negative automatic thoughts (Frewen et al., 2008), and thought suppression (Lykins & Baer, 2009) have also been reported.

**Interpersonal benefits.** Interpersonally, mindfulness has been shown to increase feelings of equanimity (Morgan & Morgan, 2005), the ability to relate to others with kindness, acceptance, and compassion (Fulton, 2005; Wallace, 2001), relationship satisfaction (Barnes, Brown, Krusemark, Campbell, Rogge, 2007), the ability to respond to relationship stress in a constructive manner (Barnes et al., 2007), effective communication between romantic partners (Barnes et al., 2007), healthier and more stable romantic relationships (Wachs & Cordova, 2007), affectionate behavior toward each partner within a relationship (Wachs & Cordova, 2007), and an increased ability to act with awareness and express oneself appropriately in social situations (Dekeyser et al., 2008).

**Physiological benefits.** Finally, there have been many reported biological and physiological benefits that occur as a result of practicing mindfulness. Some of the benefits include decreases in physical illness (McKim, 2008), increased immune function (Davidson et al., 2003), decreases in sensory pain (Grossman et al., 2004), and lessened physical impairment (Grossman et al., 2004). Additionally, mindfulness is effective at relieving distress in chronic disorders such as fibromyalgia, cancer, and coronary artery disease (Grossman et al., 2004) to name a few.

**Lovingkindness Meditation**

As previously mentioned, there are many forms of mindfulness and some have been created or adapted to produce specific outcomes. Lovingkindness meditation (LKM) is a form of mindfulness that focuses ones attention on directing kind thoughts to the self and others. Sharon
Salzberg (2011), a well-respected American Buddhist scholar, defines lovingkindness practice as “the practice of paying attention to ourselves and others with a sense of interest and care” (p.145). The practice is done by focusing caring attention in the form of specific phrases at first on ourselves, then on someone we know well, on a neutral person, on a person we having feelings of animosity toward, and finally on all creatures in the universe (Salzberg, 2011). Phrases usually take the form of “May I/you have peace”, “May I/you have joy”, “May I/you be at ease”, etc. In theory, LKM is said to be able to cultivate unconditional love, compassion, and kindness toward oneself and others (Salzberg, 1995). Given this, LKM could be used as a powerful tool to help develop self-acceptance and self-love, especially for those within a clinical context.

**Benefits of lovingkindness.** Lovingkindness is different from other mindfulness practices in that the focus of the practice is unifying us with others in our lives. The practice is intended to build empathy, a sense of connection, and help let go of difficult judgments and criticisms directed at ourselves or at others. Like mindfulness, lovingkindness practice has been around for centuries; however, it wasn’t until recently that the benefits of lovingkindness meditation have been demonstrated scientifically. Generally, LKM has been cited as being a promising practice for increasing self-compassion, reducing stress, reducing symptoms related to anxiety and depression and increasing positive affect (Boellinghaus, Jones, & Hutton, 2014; Hofmann, Grossman, & Hinton, 2011). Nevertheless, the scientific study of LKM is still a relatively new domain.

The studies that have been conducted have validated what yogis and mystics have known for centuries. Some of the benefits include increases in positive affect toward a targeted individual and a nontarget neutral individual (Fredrickson, Cohn, Coffey, Pek, and Finkel, 2008;
Hutcherson et al., 2008), greater positivity toward the self (Huterson et al., 2008), increased experience of positive emotions on a daily basis including love, joy, contentment, gratitude, pride, hope, interest, amusement, and awe which lasted after they stopped the practice (Cohn & Fredrickson, 2010; Fredrickson, Cohn, Coffey, Pek, and Finkel, 2008), increases in mindful attention, self-acceptance, and good physical health which lead people to report increases in overall life satisfaction (Fredrickson, Cohn, Coffey, Pek, and Finkel, 2008), increased empathic response (Lutz, Brefczynski-Lewis, Johnstone, & Davidson, 2008), increased ability for perspective taking (Lutz et al., 2008), increased self-compassion and compassion for others (Weibel, 2007), increases in hope, and positive affect (Sears & Kraus, 2009). Decreases have been seen in depressive symptomology (Fredrickson, Cohn, Coffey, Pek, and Finkel, 2008), cognitive distortions and negative affect (Sears & Kraus, 2009), anger, trait anxiety, pain and psychological distress (Carson, Keefe, Lynch, Carson, Goli, Fras, & Thorp, 2005; Hofmann et al., 2011).

**Lovingkindness and self-compassion.** Of particular interest is LKM’s relation to feelings of compassion for others and for the self. LKM has been described as a form of love that is an ability, and thus can be learned (Salzberg, 2011). This learning manifests as the ability to “look at ourselves and others with kindness instead of reflexive criticism…to care for ourselves unconditionally instead of thinking ‘I will love myself as long as I never make a mistake’” (p. 146, Salzberg, 2011). It may come as no surprise then that LKM has been shown to increase self-compassion, a construct that has important implications in the treatment and prevention of psychopathology.
Self-Compassion

As with other Eastern constructs, self-compassion has recently begun to gain popularity within the realm of Western psychology. Given the controversy surrounding the construct of self-esteem and the criticism this construct has received (Neff, 2003a), self-compassion has become of interest to those looking for an alternative explanation for the seemingly simple construct of “feeling good about oneself.” Kristin Neff (2003a) defines self-compassion as:

“… being touched by and open to one’s own suffering, not avoiding or disconnecting from it, generating the desire to alleviate one’s suffering and to heal oneself with kindness. Self-compassion also involves offering nonjudgmental understanding to one’s pain, inadequacies and failures, so that one’s experience is seen as part of the larger human experience.” p. 87.

Thus, self-compassion can be described as consisting of three components (Neff, 2003b). The first component is being kind and understanding of oneself instead of acting toward oneself with hostility and judgment. The second component is understanding that one’s experiences are not isolated and are in fact part of the greater human condition. In other words, recognizing that other humans feel the way “I” do and that “I” am not alone in this experience. Finally, the third component is related to mindfulness. In order to develop self-compassion, one must be able to hold thoughts and feelings in a state of awareness instead of identifying with those thoughts and feelings. Said another way, one must be able to recognize that thoughts and feelings are separate from the “self” and not become defined by how they feel or what they think.

Although many individuals would describe themselves as being kind to others, few would describe themselves as being kind to their own self and inner experiences. Many people engage in harsh criticisms and judgments of their own actions in life and are usually much harder on and crueler toward themselves than they would be toward a stranger. Negative patterns of relating to oneself are implicated in almost all psychological disorders and thus, increasing self-
compassion in those suffering from psychological conditions has begun to show promising
eresults. In fact, one of the most robust findings within the self-compassion literature is just that –
an inverse relationship with self-compassion and overall levels of psychopathology (Barnard &
Curry, 2011).

**Benefits of self-compassion.** Much of the research to date is correlational, and although
causal studies are in their infancy, the correlational outcomes provide initial evidence that
interventions which seek to increase levels of self-compassion may be effective at producing
change in other beneficial areas (Barnard & Curry, 2011). Specifically, positive correlations have
been found for self-compassion and positive affect (Leary, Tate, Adams, Allen, & Hancock.,
2007; Neff, Rude, & Kirkpatrick, 2007; Neff & Vonk, 2009), satisfaction in the ministry
(Barnard & Curry, 2011), acceptance (Leary et al., 2007; Neff, Hsieh, & Dejitterat, 2005),
positive relationship behavior toward a romantic partner (Neff & Beretvas, 2012), happiness
(Neff at al., 2007), and optimism (Neff et al., 2007) among others. Negative correlations have
been found with constructs such as negative affect (Leary et al., 2007), emotional exhaustion in
the ministry (Barnard & Curry, 2011), negative emotions (Leary, et al., 2007), shame (Barnard &
Curry, 2011), anxiety (Neff, 2003a; Neff et al., 2005; Neff, Kirkpatrick, & Rude, 2007; Neff et
al., 2007; Raes, 2010), depression (Mills, Gilbert, Bellew, McEwan, & Gale, 2007; Neff, 2003a;
Neff et al., 2007; Neff, Pisitsungkagarn, & Hsieh, 2008; Neff et al., 2007; Raes, 2010; Ying,
2009), perfectionism (Neff, 2003a; Williams, Stark, & Foster, 2008), and rumination, thought
suppression, and avoidance (Leary et al., 2007; Neff et al., 2005; Neff et al., 2007; Neff & Vonk,
2009; Raes, 2010; Thompson & Waltz, 2007) to name a few.

**Experimental induction of self-compassion.** Research dedicated to interventions aimed
at increasing self-compassion is less prolific. In fact, most studies that evaluated self-
compassion as a dependent variable were not utilizing an intervention that was specifically designed to increase self-compassion. Almost all of these research articles utilized interventions that would be considered in-depth psychotherapies such as Mindfulness-Based Stress Reduction and Compassionate Mind Training. Although such therapeutic modalities are helpful and have proven to be effective, many individuals that could benefit from an increase in self-compassion may not find intensive therapeutic treatment appealing or necessary. Given this, there are several studies have evaluated self-compassion interventions over a much shorter time period of three weeks.

Albertson and colleagues (2014) evaluated a 3-week compassion meditation program targeted at improving body satisfaction across varying aged women. Compared to the control group, participants reported significantly lower reports of body shame, dissatisfaction, and gains in self-compassion and body appreciation. Another study evaluated the effectiveness of a 3-week self-compassion group program for enhancing resilience and well-being among college-aged women (Smeets, Neff, Alberts, & Peters, 2014). Results indicated that the self-compassion intervention group demonstrated increases in self-compassion, mindfulness, optimism, and self-efficacy and decreases in rumination (Smeets et al., 2014). Finally, two studies that evaluated a brief self-compassion induction intervention found promising results related to increases in self-compassion; however, the self-compassion induction was different in each study making it difficult to draw solid conclusions (Adams & Leary, 2007; Leary et al., 2007). Thus, preliminary evidence suggests that it is possible to increase an individual’s self-reported self-compassion, however, the research is still in its infancy.

**Lovingkindness as an induction of self-compassion.** Interestingly, although lovingkindness meditation has been suggested to increase self-compassion, few studies have
evaluated the effectiveness of this meditation technique in doing so. Weibel (2007) conducted a randomized controlled trial of LKM and found that four sessions of LKM did in fact increase participants’ self-reported self-compassion. Moreover, the effect was still present at a 2-month follow-up. Weibel’s (2007) research however did not use an active comparison condition, so although the LKM group showed significant increases in self-compassion, it is difficult to say with certainty that the meditation was in fact the causal factor. Richards & Martin (2012) conducted a 2-week LKM and mindfulness program with undergraduate college students and found that LKM did in fact increase self-compassion significantly more so than the control condition. Nevertheless, the control condition was a waitlist list control, so the most that can be gained from this study is that LKM and mindfulness can increase self-compassion better than no intervention. A similar study was conducted with the addition of increasing self-compassion in self critical people (Shahar, Szsepsenwol, Zilcha-Mano, Haim, Zamir, Levi-Yeshuvi, & Levit-Binnun, 2014). Shahar et al. (2014) demonstrated that seven 90-minute weekly meetings dedicated to the practice of LKM alone decreased self-criticism and improved self-compassion and depressive symptoms. Again, however, the control group was a wait-list control, therefore subjecting this study to the same methodological weaknesses as the previous ones described.

**Mindfulness, Lovingkindness, and Acute Effects on Mood**

As previously mentioned, the benefits of mindfulness and LKM are many. Interestingly, although they are both intended to target different processes (i.e. mindfulness increases mindfulness and LKM increases compassion for the self and others), the literature available consistently shows that both have demonstrated decreases in self-reported anxiety and depression (Carson et al., 2005; Chiesa & Serretti, 2011; Hoffman et al., 2010; Hofmann et al., 2011; Klainin-Yobas, Cho, & Creedy, 2012; McCarney, Schulz, & Grey, 2012; Piet & Hougaard,
2011; Strauss, Cavanagh, Oliver, & Pettman, 2014; Vollestad, Nielsen, & Nielsen, 2011, to name only a few). Although the mindfulness literature is vast and the LKM literature is steadily growing, many of the experimental studies that have evaluated the effects of mindfulness or LKM have been part of a larger clinical intervention package (i.e. mindfulness as a component of Mindfulness-Based Stress Reduction and lovingkindness as a component of Compassion Focused Therapy) which evaluated the clinical intervention over several weeks to years. Few laboratory studies have evaluated immediate effects of a mindfulness or LKM meditation alone. Such studies are valuable contributors to the meditation literature because they are able to isolate the specific effects of mindfulness or LKM and limit the number of interfering or confounding variables which is near impossible to do when evaluating an entire clinical intervention package (Keng et al., 2011). Additionally, the laboratory studies that have been conducted on mindfulness solely have helped elucidate the processes and functions of mindfulness and how it can lead to positive psychological change in a way large scale intervention studies cannot (Keng et al., 2011). Nevertheless, the literature on the immediate effects of mindfulness or LKM on anxiety and depression is virtually nonexistent. Previous studies have demonstrated that brief, one-session mindfulness exercises can have immediate positive benefits on various psychological outcomes including dysphoric mood, decentering, physiological indicators of a stress reaction, sustained attention, and emotional reactivity (Arch & Craske, 2006; Broderick, 2005; Campbell-Sills, Barlow, Brown, & Hofmann, 2006; Erisman & Roemer, 2010; Feldman, Greeson, & Senville, 2010; Feldner, Zvolensky, Eifert, & Spira, 2003; Huffziger & Kuehner, 2009; Mohan, Sharma, & Bijlani, 2011; Mrazek, Smallwood, & Schooler, 2012; Singer & Dobson, 2007). Although these studies have shown promising results for the possibility of affecting psychological variables after only one session of meditation, none of the above
mentioned studies evaluated mood as a primary outcome of the study. To date, only one study has evaluated the effect of a single-session, brief meditation on mood states. Johnson, Gur, and David (2015) evaluated the immediate effects of mindfulness with response to mood and various cognition tasks. Although they did assess for mood variables, their primary study aim was to evaluate a randomized controlled trial comparing a brief mindfulness exercise to both a sham-meditation and a control group. Their results indicated that both the mindfulness exercise and the sham-meditation produced significant positive effects on mood (as measures by the Profile of Mood States), namely demonstrating a reduction in self-reported tension, confusion, and total distress. The authors concluded that even a brief, single-session “meditation experience” can have significant positive effects on mood (Johnson et al., 2015). Although Johnson et al. (2015) did take mood into consideration when conducting their study, they did not evaluate anxiety and depression specifically and were more interested in generic mood states. Thus, their study presents promising evidence for the fact that a single session meditation can in fact affect mood states, but further work is needed to identify whether facets of anxiety or depression can be specifically targeted in only one, brief, mediation session.

It is important to highlight that acute effects of meditation have long been overlooked within the realm of all facets of empirical research. This is likely due to the fact that mindfulness was largely made popular by Jon Kabat-Zinn’s Mindfulness-Based Stress Reduction 8-week program. Although mindfulness had been utilized prior to Kabat-Zinn’s program, it was not yet experimentally validated in the same rigorous fashion as Kabat-Zinn as his team. Once Kabat-Zinn was able to show that mindfulness was able to produce reliable improvement to overall health and wellness, others in the field began replicating his findings and most stuck to the 8-week format. With the surge in holistic treatment and focus on preventative medicine in our
present society, it is becoming ever more important to understand the dose-response impact of mindfulness. In the clinical setting, session limits imposed by insurance companies may not allow for 8-week intensive treatment programs which makes brief, impactful interventions seem much more attractive. Additionally, many primary care and hospital physicians are looking for alternatives to medication management for conditions such as chronic pain and substance use, however, working within the medical model makes it very difficult to meet with patients for repeated weekly sessions. Thus, medical practitioners could also benefit from the empirical support for the acute effects of mindfulness and may be more likely to teach patients brief mindfulness exercises in substitute for heavy medication management. Furthermore, there seems to be no golden rule within the literature that mindfulness will only deliver positive outcomes after an 8-week period. We have little information on how many mindfulness sessions it takes to see substantial change and therefore, it could be possible that individual’s seeking treatment could benefit from one or two exposures to a mindfulness exercise. Finally, of the few studies that have been conducted on single-session effects, results are mixed and the manipulations and outcome measures vary greatly (Jacobs, Cardaciottlo, Block-Lerner, McMahon, 2013; Johnson et al., 2015; Rausch, Gramling, Auerbach, 2006; Sharpe, Nicholson Perry, Rogers, Refshauge, Nicholas, 2013; Weinstein, M. & Smith, 1992). As mentioned previously, acute effects of a meditation intervention have been evaluated within the realm of mood states, but the body of literature is small and again, methods vary greatly. It seems that starting small and looking at what a single session mindfulness meditation can affect would be a way to ideally tease apart not only the mechanisms of change but also whether multiple mindfulness experiences are necessary to produce the desired changes.
Study Aims

Although still lacking, there is a growing body of research that supports the idea that not only is self-compassion a beneficial trait that can be acquired, but that it can be acquired through the practice of lovingkindness meditation. Nevertheless, the current literature is lacking in replication studies and in studies that utilize an active control condition. Given the many benefits of mindfulness alone, it remains unclear as to whether the actual practice of LKM contributes to increases in self-compassion and psychological health or whether just the act of focusing the mind by means of a non-LKM exercise would produce the same results. Thus, the aim of this study is threefold: 1) determine if a brief-15 minute meditation can have immediate effects on mood variables such as anxiety and depressive cognitions 2) determine whether LKM and breathing mindfulness target the psychological processes they claim to target, namely mindfulness and self-compassion, 3) determine if there is differential efficacy between the two meditations. Essentially, the aim of this study is to determine the discriminant validity of LKM and mindfulness meditation.

Method

Participants

Participants were recruited from the undergraduate research pool and were awarded 1.0 credit hour of extra credit for their participation. A pre-screen was deemed unnecessary due to the inclusive nature of the experimental design. Nevertheless, exclusion criteria were still warranted, namely, those under the age of 18 could not legally consent and thus were excluded from the study and individuals whose native language is not English were not eligible to participate. In order to ensure adequate power for statistical analyses, approximately 150 subjects needed to be recruited. GPOWER suggests that the pre-post differences in self-
compassion or mindfulness can be detected with a power of .8 if the effects are approximately $dz = .35$ and the pre-post correlations are 0.5 with an N of 75 per group.

**Measures**

**Demographics.** Demographic information was collected at pre-test only. Participants were asked to respond to questions that assess general demographic information (i.e. race, gender, age, etc.). Additionally, participants were also asked about their previous meditation experience and additional spiritual practices they have previously engaged in.

**Infrequency items.** Six items were created to assess the degree to whether an individual was randomly responding or actually paying close attention to their responses. Individual infrequency items were placed throughout the assessment battery; three in the pre-test and three in the post-test. Examples of infrequency items include “Select the number 3” where the response options are a, w, 3, b and “Select the letter K” where the response options are 1, 2, 3, K.

**Meditation attitudes and experiences.** Several items were developed in order to assess the participants’ level of engagement in the meditation and their attitudes towards the meditations after they had experienced them. Examples of engagement questions include “Did you actually try to do the meditation?” and “Would you do the meditation again?” Examples of attitudes toward the meditation include “Do you believe that meditation can be helpful?” and “Do you think that meditation is a legitimate practice?” In addition to the self report measures of attitude toward the meditation, a behavioral indicator was created for the purpose of addressing potential social desirability within the self-report measure. At the beginning of the meditation session, participants were instructed that there would be hard copies of the meditation scripts and that these would be free to take upon completion of the study. A specific number of
meditation scripts were counted at the beginning of each session (enough for each participant to take one) and then again at the end in order to determine how many participants enjoyed the meditation enough to actually take a script.

**Automatic Thoughts Questionnaire.** The Automatic Thoughts Questionnaire (ATQ; Hollon & Kendall, 1980) was designed to measure the frequency of automatic cognitions within the realm of depression that manifest as self-statements. Specifically, the ATQ was designed to measure fluctuations in these depressive automatic cognitions following a clinical intervention. Thus, in this study, the ATQ was used to identify whether the meditations had an acute impact on a facet of depression, namely automatic cognitions. The ATQ consists of 30 items which are scored on a 5-point Likert scale ranging from “Not at all” to “All the time” to provide a total score of the frequency of occurrence of the negative cognitions. Additionally, the ATQ provides four subscales that are reflective of various facets of automatic depressive cognitions: personal maladjustment and desire for change (PMDC; i.e., “I wish I were a better person”), negative self-concepts and negative expectations (NSNE; i.e., “Why can’t I ever succeed?”), low self-esteem (LSE; i.e., “I hate myself”), and Helplessness (i.e., “I can’t finish anything”). The ATQ has demonstrated good convergent and discriminant validity between depressed and non-depressed samples (Harrell & Ryon, 1983; Hollon & Kendall, 1980). Average total scores for clinically depressed populations have ranged from 79.64 (SD=22.29) to 88.90 (SD=21.15) whereas average total scores for non-depressed individuals has been shown to be 48.57 (SD=10.89) and 38.35 (SD=8.17; Hollon & Kendall, 1980 and Harrell & Ryon, 1983, respectively). Additionally, the ATQ has demonstrated excellent reliability (α=.94 and α=.96; Harrell & Ryon, 1983; Hollon & Kendall, 1980, respectively). Internal consistencies for the current study were excellent (α=.97 for pre- and post-test).
**Self-Compassion Scale.** In order to assess self-compassion, participants completed the 26-item Self-Compassion Scale (SCS; Neff, 2003b). The SCS was administered during the pre- and post-test in order to detect subtle changes in self-compassion. The SCS consists of six subscales designed to evaluate the six core components of self-compassion. The subscales are designed to measure opposite poles of the three core self-compassion constructs, namely mindfulness, self-kindness, and over identification. Thus the measure includes the 4-item Mindfulness subscale (e.g., “When something upsets me, I try to keep my emotions in balance”), the 4-item Over-Identification subscale (e.g., “When something upsets me I get carried away with my feelings”), the 5-item Self-Kindness subscale (e.g., “When I’m going through a very hard time, I give myself the caring and tenderness I need”), the 5-item Self-Judgment subscale (e.g., “When I see aspects of myself that I don’t like, I get down on myself”), the 4-item Common Humanity subscale (e.g., “I try to see my failings as part of the human condition”), and the 4-item Isolation subscale (e.g., “When I’m really struggling, I tend to feel like other people must be having an easier time of it”). Responses are in the form of a 5-point Likert scale ranging from “Almost Never” to “Almost Always.” Although the six factors are strongly intercorrelated, research has shown that this intercorrelation can be explained by a single latent factor of “self-compassion” (Neff, 2003b). The SCS has also demonstrated good concurrent validity, convergent validity, discriminate validity, and test-retest reliability ($\alpha=.93$ for total scale score of self-compassion; Neff, 2003b). Internal consistencies for the present study were excellent ($\alpha=.90$ for pre-test and $\alpha=.92$ for post-test).

**Social Desirability Scale.** The Social Desirability Scale (SDS; Crowne & Marlowe, 1960) was initially created to identify the response bias of social desirability, or an individual’s tendency to provide responses that are reflective of what they think a good response should be
and not necessarily their honest response. Due to the lengthy nature of the current study’s assessment battery, the 13-item short form was used instead of the 33-item original version. Although several short versions of the SDS have been tested, the 13-item form consistently demonstrates the best fit, reliability (α=.62), and validity (Loo & Thorpe, 2000; Reynolds, 1982). The SDS consists of 13 items with response options of true or false. Items include statements like, “No matter who I am talking to, I am always a good listener” and “I sometimes try to get even rather than forgive and forget.” Internal consistency for the present sample was poor (α=.57). Although the internal consistency for the current sample was quite poor, it is noteworthy to mention that internal consistencies for the 13-item version are not usually very high (α=.62 - .76; Reynolds, 1980; Loo & Thorpe, 2000, respectively).

**State-Trait Anxiety Inventory for Adults.** In order to determine whether shifts in anxiety have occurred, participants completed the State-Trait Anxiety Inventory for Adults (STAI; Spielberger, 1983). Participants completed both the state and trait measures during the pre-test and only the state measure during the post-test. Both the state and trait forms contain 20 statements that pertain to the individuals’ description of themselves. The state form assesses how the individual statements pertain to them right now, in this moment, while the trait form assesses how the individual statements pertain to how the individual generally feels. Response options are on a 4-point Likert scale and range from “Almost never” to “Almost always.” The STAI has demonstrated excellent psychometric properties. Internal consistencies have been calculated across different populations and range from .86-.95 (Creamer, Foran, & Bell, 1995; Spielberger, 1983). The internal consistencies for the state measure in this study were excellent for pre-test (α=.93) and for post-test (α=.92). The internal consistency for the trait measure
was also excellent ($\alpha= .93$). Previous research indicates that a total state score of 39-40 or higher indicates clinically significant anxiety (Julian, 2011).

**Toronto Mindfulness Scale.** The Toronto Mindfulness Scale was used to assess state-mindfulness and was specifically designed to assess an individuals’ ability to experience facets of mindfulness upon completion of a meditation (TMS; Lau et al., 2006). The TMS is a 13 item scale which seeks to assess the extent to which an individual was able to engage in a mindfulness session (e.g. “I was aware of my thoughts and feelings without overidentifying with them”). Responses are on a 5-point Likert scale and range from “Not at all” to “Very much.” The TMS has demonstrated good psychometric properties including criterion validity, incremental validity, and internal consistency ($\alpha=.95$; Lau et al., 2006). In order to assess for fluctuations in mindfulness, the TMS will be administered during the pre- and post-test assessment batteries. To date, the TMS is the only assessment designed to measure “state” mindfulness with at least 10 other mindfulness assessments focusing solely on “trait” mindfulness (Sauer, Walach, Schmidt, Hinterberger, Lynch, Büssing, & Kohls, 2013). The TMS was initially designed to be administered following a meditation session, however, in the current study; it was also used to gather data related to participants’ mindfulness levels before they began the meditation. In order to do so, the instructions were slightly modified and asked the participant to think about how they felt before entering the testing room instead of asking them to think about how they felt after the meditation. Internal consistencies for the current sample were very good ($\alpha=.83$ for pre-test and $\alpha=.91$ for post-test).

**Visual Analog Scales.** In order to assess state self-compassion, three visual analog scales (VAS) were created for this study. To date, there is no assessment that assesses state self-compassion, and seeing as how it is not a static trait, it is important to measure whether a
fluctuation in an individual’s self-reported self-compassion has occurred. Visual Analog Scales were created in order to obtain an unbiased judgment of psychological or behavioral characteristics (Rossi & Pourtois, 2012). A VAS is a graphic rating scale that implies continuous levels of expression between two anchor points. Individuals are asked to choose a point on the line between the two anchors that represents how they currently feel. For the purpose of this study, three VAS scales were created in order to reflect the three constructs that make up the overall latent construct of self-compassion. Participants were asked to complete the three VAS at pre-test and post-test with hopes of capturing fluctuations in state self-compassion. The three VAS are Mindfulness (anchors are “I am my thoughts and have a hard time noticing that they are separate from my sense of self” and “I am able to notice my thoughts as thoughts and that they are separate from my sense of self”), Common Humanity (anchors are “I feel disconnected from others” and “I feel connected to others”), and Self-Kindness (anchors are “I am harsh on myself” and “I am gentle and kind with myself”). VAS’s have demonstrated good psychometric properties. Although internal consistency is not available due to the single item nature of the scale, it has demonstrated good external validity, concurrent validity, and discriminant validity (Rossi & Pourtois, 2012). Studies that evaluated test-retest reliability have found that the VAS is sensitive to changes in the variable being measured (Rossi & Pourtois, 2012). Due to the online nature of the assessments in this current study, the VAS was adapted to an online format (versus paper and pencil). Participants were presented with the two anchor points for each VAS and asked to select a “bubble” in between the two anchor points. Each VAS had twenty “bubbles” in linear format to pick from in between anchor points.
Procedures

Participants were randomly assigned to one of the two meditation conditions. Random assignment took place at the beginning of each data collection session. Random assignment occurred by having the research assistant blindly select either a 1 or a 2 from a bag. If the research assistant selected a 1, the data collection session was for the loving-kindness meditation. If the research assistant selected a 2, the data collection session was for the breathing meditation. Data collection sessions took place in a group format in a computer laboratory. Once the session was randomly assigned, participants completed a pre-test which will consisted of demographics, the STAI (just the state version), the SCS, the TMS, the ATQ, and the VAS. Once everyone in the data collection session had completed their pre-test, they were asked to listen to instructions detailing how to participate in the meditation they were randomly assigned to complete (between 2 and 5 minutes). Following the instructions, participants were asked to participate in their assigned meditation (approximately 15 minutes). Upon completion of the meditation, participants concluded the session by taking a post-test which consisted of the STAI (both the state and trait scales), the TMI, the SCS, the ATQ, the SDS, and the VAS. Full versions of the scales can be found in Appendix A and full scripts of the instructions and meditations can be found in Appendix B.

Analytic Plan

Data were analyzed using linear effects mixed modeling. There are many advantages to utilizing a linear mixed effects (LME) model for repeated measures analysis. First, missing data does not pose a problem that needs to be addressed when analyzing data with LME (West, Welch, Galecki, 2007). LME is able to flexibly incorporate missing data into the entire estimation model by estimating the treatment effects from the data (Gallop & Tasca, 2009)
which is a clear advantage over a traditional general linear model (GLM). Second, LME does not fall victim to the assumption of sphericity or compound symmetry like a GLM model does (Howell, n.d.). LME permits the specification of a covariance matrix, thus allowing for the matrix that best fits the data to be utilized. Compound symmetry can be used to analyze the data in LME, but it is not a requirement as it is with GLM. This is a clear advantage since many data points in a repeated measures analysis do not follow the assumption of sphericity, especially when the study is evaluating an intervention effect. Third, LME is able to compute a model regardless of correlated data and unbalanced conditions (SPSS Technical Report, 2005). In the present study, it is assumed that many of the outcome variables will be correlated thus making GLM (which assumes uncorrelated measures) unusable. Additionally, LME allows for unbalanced conditions (or unequal subjects in each condition) which is a much more reasonable assumption given that conditions were assigned randomly. Finally, LME is robust to the effects of non-independent and identically distributed random variables (SPSS Technical Report, 2005). In most analytic procedures, normal distributions and independence from other variables is a necessary assumption. LME allows for variables to be included in the model without the worries of skewness and independence which allows for more flexibility in interpreting results, particularly those that are skewed.

Separate mixed models were tested for each outcome variable in SPSS PASW Statistics version 18 using maximum likelihood estimation. Each model included three fixed effects: main effects for time and condition and an interaction effect between time and condition. Four models were tested for each outcome variable. In the first model, only fixed effects were tested. This was done in order to create a baseline level of comparison before adding in the random effect of within subject variation. The second model added a random intercept into the model in order to
account for within subject variation (or random deviations for a given subject). The third model added an additional random factor that not only accounted for random deviations within subjects, but also within time (time 1 and time 2). Finally, a fourth model was tested which included a random slope in addition to the random intercept and random effect of time. The Likelihood Ratio Test was used to determine the best fitting model for each outcome variable. Compound Symmetry, Unstructured, and Diagonal covariance matrices were all tested to determine the best fitting matrix. The Likelihood Ratio Test revealed that all outcome variables except for one fit best under model two using the compound symmetry covariance matrix. The Self-Compassion subscale of Isolation demonstrated the best fit under model three and utilized an Unstructured covariance matrix.

Age, gender, whether they believed the meditation was helpful (i.e. believability), Social Desirability Scale, and the State-Trait Anxiety Inventory Trait Scale were all entered as covariates in each model. Age was included due to the fact that one condition was significantly older than the other (see Table 1). Although gender did not demonstrate significant differences between groups, it was included as a covariate in order to account for any specific gender effects that may occur within the outcome measures (i.e. men tend to score lower than women on depression scales, etc.). The SDS was included as a covariate in order to account for any potential demand characteristics that might be elicited through the self-report nature of the measures. Finally, the STAIT was significantly correlated with most outcome measures and thus was included to account for the level of anxiety that the participants in the study typically experienced. Additionally, individuals who report high levels of anxiety may have a more difficult time engaging in meditation-type experiences due to their struggles with attentional control (Bishop, 2008; Pacheco-Unguetti, Acosta, Callejas, Lupiáñez, 2010). It would seem that
since meditation is primarily an attentional task (i.e. focus your attention on your breath) individuals with high trait anxiety may find this to be difficult to engage in. Thus, trait anxiety was entered as a covariate in order to control for the attentional difficulties inherent in anxiety sufferers that may affect the results of the meditation outcome measures.

Finally, all outcome variables were assessed to determine if any of the LME assumptions had been violated. Each outcome variable was examined in a Q-Q plot, a scatterplot of predicted values versus residual values, and the Kolmogorov-Smirnov Test of normality of residuals. All outcome variables demonstrated excellent adherence to the LME assumptions except for the Automatic Thoughts Questionnaire. The Automatic Thoughts Questionnaire showed severe heteroskedasticity thus making the results unreliable. A log10 transform was selected based on suggestions in the LME literature (Winter, 2013) and greatly improved the heteroskedasticity of the measure. Although significant results will only be based on the log10 transformed data, the raw data will also be reported in order to ease the interpretation of the transformed outcome measure.

Results

Missing and Excluded Data

187 individuals participated in the study. Participant data was removed for the following reasons: 7 removed because they were under the age of 18 and could not legally consent to the study, 2 were removed because they failed the infrequency tests, and 1 was removed because they logged into the survey but did not complete any assessments. The final participant count was therefore 177. Missing data was addressed using mean substitution of the specific variable mean in question. Even though missing data is not necessary to address when conducting a
linear effects mixed model (West, Welch, & Gałecki, 2007), it was attended to in the present study more for the sake of consistency.

**Demographics and Meditation Attitudes**

For complete demographic and meditation attitudes data, see Table 1. Participants included 83 females (46.9%) and 94 males (53.1%). The mean age was 19.09 (SD= 1.66), 58.2% classified their ethnicity as White, and 59.9% were freshman. Approximately half had never meditated before (42.9%) while the other half reported having tried meditation a couple of times before (44.1%). Most had never practiced yoga (84.9%). Only 5 people reported not even trying to do the meditation which reflects that most of the current sample at least tried to stay engaged with the meditation. 75.7% rated the meditation as neutral (neither liked it nor disliked it) or positively. 74.6% stated that they would do the meditation again and 80.2% stated that they would recommend the meditation to a friend. Over half had never heard of either mindfulness or lovingkindness meditation (52.5%), however, most believed that meditation is a helpful practice (96.6%), either for themselves or for others. Finally, only one participant reported that they do not think meditation is a legitimate practice and about half of the sample reported having a positive or neutral attitude toward meditation. The only significant difference between conditions was for age with those in the LKM condition being significantly older (M=19.37, SD=2.09) than those in the in Breathing condition (M=18.87, SD=1.13), t(175)=2.01, p=.046. There were no additional significant differences between groups with regard to demographic information and meditation attitudes (See Table 1). Overall, the sample demonstrated a clinically significant level of state anxiety and a non-clinical level of depression. Although the average state level of anxiety for the current sample was within clinical cut-scores, the trait measure revealed that on average, the sample was less anxious the day of the study than they
typically are, indicating that this sample likely was representative of a highly anxious group of college students.

Only 18 of the original 187 participants took a copy of the meditation script which equates to 9.6% of the original sample. It is interesting to compare this percentage with the 74.9% who responded they would do the meditation again and suggests that an individual who does not take a script may still have experienced the meditation as something they would do again and thus likeable. There was not a significant difference between groups with regard to the number of meditation scripts taken, $\chi^2 (2, N=177)= 2.77, p=.09$. Although not reflected in the statistical output, it seems anecdotally that the participants were more inclined to take a copy of the breathing meditation script that they were the LKM script. A script was taken during 78% of the data collection sessions for the breathing meditation compared to a script being taken from 13% of the data collection sessions for the LKM.
Table 1. Demographic Information and Meditation Attitudes

<table>
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<tr>
<th></th>
<th>Frequency</th>
<th>Percentage</th>
<th>Tests of Differences Between Conditions</th>
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<tr>
<td>Gender</td>
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</tr>
<tr>
<td>Male</td>
<td>94</td>
<td>53.1%</td>
<td>(\chi^2 (1, N=177)= .55, p= .46)</td>
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<tr>
<td>Female</td>
<td>83</td>
<td>46.9%</td>
<td></td>
</tr>
<tr>
<td>Age</td>
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<td></td>
</tr>
<tr>
<td>18</td>
<td>87</td>
<td>49.2%</td>
<td>(t(175)= 2.01, p= .046^*)</td>
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<td>2</td>
<td>1.1%</td>
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<td>103</td>
<td>58.2%</td>
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<tr>
<td>Black or African American</td>
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<tr>
<td>Senior</td>
<td>19</td>
<td>10.7%</td>
<td></td>
</tr>
<tr>
<td>Experience with Meditation</td>
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<td></td>
<td>(\chi^2 (7, N=177)= 7.21, p= .41)</td>
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<tr>
<td>Never meditated</td>
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<td>42.9%</td>
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</tr>
<tr>
<td>Tried meditation a couple of times</td>
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<td>44.1%</td>
<td></td>
</tr>
<tr>
<td>Meditate a few times per year</td>
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<td>4.0%</td>
<td></td>
</tr>
<tr>
<td>Meditate several times per week</td>
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<td>1.7%</td>
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</tr>
<tr>
<td>I have a daily meditation practice</td>
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<td>.6%</td>
<td></td>
</tr>
<tr>
<td>No formal practice but I incorporate mindfulness throughout the day</td>
<td>7</td>
<td>4.0%</td>
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</tr>
<tr>
<td>I tend to yo-yo</td>
<td>4</td>
<td>2.3%</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>1</td>
<td>.6%</td>
<td></td>
</tr>
<tr>
<td>Did you do the meditation?</td>
<td></td>
<td></td>
<td>(\chi^2 (3, N=177)= 4.77, p= .19)</td>
</tr>
<tr>
<td>I tried to stay engaged with the meditation for the whole time</td>
<td>123</td>
<td>69.5%</td>
<td></td>
</tr>
<tr>
<td>I tried to stay engaged with the meditation but eventually gave up</td>
<td>47</td>
<td>26.6%</td>
<td></td>
</tr>
<tr>
<td>I didn’t even try to do it</td>
<td>5</td>
<td>2.8%</td>
<td></td>
</tr>
<tr>
<td>Did you like the meditation?</td>
<td></td>
<td></td>
<td>(\chi^2 (7, N=177)= 5.15, p= .64)</td>
</tr>
<tr>
<td>I really liked it a lot</td>
<td>26</td>
<td>14.7%</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>17</td>
<td>9.6%</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>37</td>
<td>20.9%</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>21</td>
<td>11.9%</td>
<td></td>
</tr>
</tbody>
</table>
| I neither liked it nor disliked it | 33 | 18.6%      | continued on next page
I absolutely hated it

Would you do this meditation again?
Yes 132 74.6%
No 45 25.4%

Would you recommend this meditation to a friend?
Yes 142 80.2%
No 35 19.8%

Have you heard of mindfulness or lovingkindness before?
I’ve heard of both mindfulness and lovingkindness meditation 23 13.0%
I’ve only heard of mindfulness meditation 57 32.2%
I’ve only heard of lovingkindness meditation 3 1.7%
I haven’t heard of either 93 52.5%

Do you believe meditation can be helpful?
I believe meditation can be helpful 143 80.8%
I believe meditation can be helpful to other people but not for myself 27 15.3%
I don’t believe meditation is helpful for anyone 1 .6%
I don’t know 6 3.4%

Do you think meditation is a legitimate practice?
Yes 138 78.0%
I’m not sure 38 21.5%
No 1 .6%

General attitude toward meditation
Very positive…I think meditation is a great practice 42 23.7%
2 0 0
3 2 1.1%
4 1 .6%
Neutral…I don’t have a positive or negative attitude toward meditation 38 21.5%
6 14 7.9%
7 36 20.3%
8 31 17.5%
9 11 6.2%
Very negative…I think it’s stupid/don’t like it at all 0 0
Outcome Variables

Descriptive statistics for all outcome measures are reported in Table 2.

Table 2. Descriptive Statistics for Self-Report Measures

<table>
<thead>
<tr>
<th></th>
<th>LKM (M(SD))</th>
<th>Breathing (M(SD))</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Time 1</td>
<td>Time 2</td>
</tr>
<tr>
<td>ATQ</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>52.48 (20.95)</td>
<td>51.89 (22.95)</td>
</tr>
<tr>
<td>Helplessness</td>
<td>2.78 (1.24)</td>
<td>2.90 (1.63)</td>
</tr>
<tr>
<td>LSE</td>
<td>2.67 (1.33)</td>
<td>2.78 (1.54)</td>
</tr>
<tr>
<td>NSNE</td>
<td>11.27 (4.78)</td>
<td>11.31 (5.47)</td>
</tr>
<tr>
<td>PMDC</td>
<td>10.24 (4.60)</td>
<td>10.02 (4.66)</td>
</tr>
<tr>
<td>SCS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>3.08 (.65)</td>
<td>3.15 (.66)</td>
</tr>
<tr>
<td>Common</td>
<td>2.96 (.89)</td>
<td>3.05 (.89)</td>
</tr>
<tr>
<td>Humanity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Isolation</td>
<td>2.72 (1.04)</td>
<td>2.62 (.94)</td>
</tr>
<tr>
<td>Mindfulness</td>
<td>2.30 (.85)</td>
<td>3.06 (.79)</td>
</tr>
<tr>
<td>Over-identification</td>
<td>2.81 (.96)</td>
<td>2.72 (.99)</td>
</tr>
<tr>
<td>Self-judgment</td>
<td>2.75 (.92)</td>
<td>2.71 (.87)</td>
</tr>
<tr>
<td>Self-kindness</td>
<td>2.84 (.89)</td>
<td>2.87 (.86)</td>
</tr>
<tr>
<td>SDS</td>
<td></td>
<td>5.46 (2.53)</td>
</tr>
<tr>
<td>STAIS</td>
<td>39.91 (11.11)</td>
<td>36.40 (9.83)</td>
</tr>
<tr>
<td>STAIT</td>
<td></td>
<td>42.74 (9.96)</td>
</tr>
<tr>
<td>TMS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>37.40 (8.22)</td>
<td>40.62 (8.87)</td>
</tr>
<tr>
<td>Curiosity</td>
<td>18.61 (4.92)</td>
<td>19.19 (4.83)</td>
</tr>
<tr>
<td>Decentering</td>
<td>18.79 (4.16)</td>
<td>21.43 (5.03)</td>
</tr>
<tr>
<td>VAS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Common</td>
<td>11.93 (5.98)</td>
<td>12.06 (6.04)</td>
</tr>
<tr>
<td>Humanity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kindness</td>
<td>11.35 (5.29)</td>
<td>11.61 (5.24)</td>
</tr>
<tr>
<td>Mindfulness</td>
<td>11.66 (5.92)</td>
<td>12.57 (5.76)</td>
</tr>
</tbody>
</table>

Note. ATQ = Automatic Thoughts Questionnaire; LSE = Low Self Esteem Subscale; NSNE = Negative Self-Concepts and Negative Expectations Subscale; PMDC = Personal Maladjustment and Desire for Change Subscale; SCS = Self-Compassion Scale; SDS = Social Desirability Scale; STAIS = State-Trait Anxiety Inventory State Form; STAIT = State-Trait Anxiety Inventory Trait Form; TMS = Toronto Mindfulness Scale; VAS = Visual Analog Scale

Results from the estimated marginal means for outcome measures and the mixed model analysis can be found in Table 3 and Table 4 respectively. A significant time effect was
demonstrated for all outcome variables except two subscales on the ATQ (Helplessness and Low Self Esteem), the Mindfulness subscale on the Self-Compassion Scale, the Curiosity subscale of the TMS, and all three of the Visual Analog Scales. The significant time effects indicated that all variables moved in the hypothesized directions (i.e. anxiety scores decreased, mindfulness scores increased, etc.) from Time 1 to Time 2 and illustrate an acute, positive effect for both meditation conditions. Significant main effects for condition were found in six of the outcome variables: ATQ Total Score, ATQ helplessness subscale, ATQ PMDC subscale, SCS judgment subscale, SCS isolation subscale and VAS for common humanity. Individuals in the breathing condition scored significantly higher than those in the LKM condition on the ATQ Total Score, ATQ helplessness subscale, ATQ PMDC subscale, SCS judgment subscale, and SCS isolation subscale. Individuals in the LKM condition scored significantly higher than those in the breathing condition on the VAS common humanity scales. One interaction effect was found to be significant. The ATQ NSNE scale demonstrated a significant decrease from time 1 to time 2 only for the breathing condition.
### Table 3. Mixed Model Estimated Marginal Means and Standard Errors for Outcome Measures

<table>
<thead>
<tr>
<th></th>
<th>LKM Breathing</th>
<th>Time 1</th>
<th>Time 2</th>
<th>Time 1</th>
<th>Time 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATQ Total</td>
<td></td>
<td>52.13 (1.72)</td>
<td>51.53 (1.72)</td>
<td>57.98 (1.58)</td>
<td>54.19 (1.58)</td>
</tr>
<tr>
<td>ATQ Total Log</td>
<td></td>
<td>1.69 (.01)</td>
<td>1.68 (.01)</td>
<td>1.73 (.01)</td>
<td>1.70 (.01)</td>
</tr>
<tr>
<td>ATQ Helplessness</td>
<td></td>
<td>2.76 (.15)</td>
<td>2.88 (.15)</td>
<td>3.26 (.14)</td>
<td>3.18 (.14)</td>
</tr>
<tr>
<td>ATQ Helplessness Log</td>
<td></td>
<td>.41 (.02)</td>
<td>.42 (.02)</td>
<td>.46 (.02)</td>
<td>.46 (.02)</td>
</tr>
<tr>
<td>ATQ NSNE</td>
<td></td>
<td>11.21 (.43)</td>
<td>11.25 (.43)</td>
<td>12.69 (.39)</td>
<td>11.60 (.39)</td>
</tr>
<tr>
<td>ATQ NSNE Log</td>
<td></td>
<td>1.02 (.01)</td>
<td>1.01 (.01)</td>
<td>1.06 (.01)</td>
<td>1.03 (.01)</td>
</tr>
<tr>
<td>ATQ LSE</td>
<td></td>
<td>2.63 (.15)</td>
<td>2.74 (.15)</td>
<td>2.86 (.14)</td>
<td>2.91 (.14)</td>
</tr>
<tr>
<td>ATQ LSE Log</td>
<td></td>
<td>.39 (.02)</td>
<td>.40 (.02)</td>
<td>.41 (.02)</td>
<td>.41 (.02)</td>
</tr>
<tr>
<td>ATQ PMDC</td>
<td></td>
<td>10.17 (.38)</td>
<td>9.94 (.38)</td>
<td>11.57 (.35)</td>
<td>10.80 (.35)</td>
</tr>
<tr>
<td>ATQ PMDC Log</td>
<td></td>
<td>.97 (.01)</td>
<td>.96 (.01)</td>
<td>1.03 (.01)</td>
<td>.99 (.01)</td>
</tr>
<tr>
<td>SCS Total</td>
<td></td>
<td>3.09 (.05)</td>
<td>3.15 (.05)</td>
<td>2.93 (.05)</td>
<td>3.06 (.05)</td>
</tr>
<tr>
<td>SCS Humanity</td>
<td></td>
<td>2.95 (.09)</td>
<td>3.05 (.09)</td>
<td>2.81 (.09)</td>
<td>2.96 (.09)</td>
</tr>
<tr>
<td>SCS Isolation</td>
<td></td>
<td>2.70 (.09)</td>
<td>2.61 (.07)</td>
<td>2.94 (.08)</td>
<td>2.83 (.07)</td>
</tr>
<tr>
<td>SCS Mindfulness</td>
<td></td>
<td>2.98 (.08)</td>
<td>3.04 (.08)</td>
<td>3.01 (.08)</td>
<td>3.13 (.08)</td>
</tr>
<tr>
<td>SCS Overidentified</td>
<td></td>
<td>2.80 (.08)</td>
<td>2.71 (.08)</td>
<td>2.96 (.08)</td>
<td>2.85 (.08)</td>
</tr>
<tr>
<td>SCS Kindness</td>
<td></td>
<td>2.83 (.09)</td>
<td>2.86 (.09)</td>
<td>2.67 (.08)</td>
<td>2.83 (.08)</td>
</tr>
<tr>
<td>SCS Judgment</td>
<td></td>
<td>2.74 (.08)</td>
<td>2.69 (.08)</td>
<td>2.99 (.07)</td>
<td>2.84 (.07)</td>
</tr>
<tr>
<td>STAIS</td>
<td></td>
<td>39.94 (.85)</td>
<td>36.43 (.85)</td>
<td>39.94 (.78)</td>
<td>35.08 (.78)</td>
</tr>
<tr>
<td>TMS Total</td>
<td></td>
<td>37.19 (.91)</td>
<td>40.40 (.91)</td>
<td>37.96 (.83)</td>
<td>41.23 (.83)</td>
</tr>
<tr>
<td>TMS Curiosity</td>
<td></td>
<td>18.52 (.52)</td>
<td>19.09 (.52)</td>
<td>19.08 (.48)</td>
<td>19.37 (.48)</td>
</tr>
<tr>
<td>TMS Decentering</td>
<td></td>
<td>18.68 (.49)</td>
<td>21.31 (.49)</td>
<td>18.88 (.45)</td>
<td>21.86 (.45)</td>
</tr>
<tr>
<td>VAS Common Humanity</td>
<td></td>
<td>12.12 (.61)</td>
<td>12.23 (.61)</td>
<td>10.04 (.56)</td>
<td>11.28 (.56)</td>
</tr>
<tr>
<td>VAS Kindness</td>
<td></td>
<td>11.47 (.57)</td>
<td>11.73 (.57)</td>
<td>10.36 (.53)</td>
<td>10.68 (.53)</td>
</tr>
<tr>
<td>VAS Mindfulness</td>
<td></td>
<td>11.68 (.62)</td>
<td>12.60 (.62)</td>
<td>11.82 (.57)</td>
<td>11.20 (.57)</td>
</tr>
</tbody>
</table>

*Note.* ATQ = Automatic Thoughts Questionnaire; LSE = Low Self Esteem Subscale; NSNE = Negative Self-Concepts and Negative Expectations Subscale; PMDC = Personal Maladjustment and Desire for Change Subscale; SCS = Self-Compassion Scale; STAIS = State-Trait Anxiety Inventory State Form; TMS = Toronto Mindfulness Scale; VAS = Visual Analog Scale
Table 4. Mixed Model Results for Outcome Measures

<table>
<thead>
<tr>
<th></th>
<th>Time</th>
<th>Condition</th>
<th>Time*Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>Df</td>
<td>F</td>
</tr>
<tr>
<td>ATQ Total</td>
<td>7.90*</td>
<td>1, 175</td>
<td>3.67</td>
</tr>
<tr>
<td>ATQ Total Log</td>
<td>11.83*</td>
<td>1, 175</td>
<td>4.72*</td>
</tr>
<tr>
<td>ATQ Helplessness</td>
<td>.07</td>
<td>1, 175</td>
<td>4.69*</td>
</tr>
<tr>
<td>ATQ Helplessness Log</td>
<td>.01</td>
<td>1, 175</td>
<td>5.62*</td>
</tr>
<tr>
<td>ATQ LSE</td>
<td>1.34</td>
<td>1, 175</td>
<td>1.09</td>
</tr>
<tr>
<td>ATQ LSE Log</td>
<td>.63</td>
<td>1, 175</td>
<td>.65</td>
</tr>
<tr>
<td>ATQ NSNE</td>
<td>6.73*</td>
<td>1, 175</td>
<td>2.81</td>
</tr>
<tr>
<td>ATQ NSNE Log</td>
<td>10.30*</td>
<td>1, 175</td>
<td>3.33</td>
</tr>
<tr>
<td>ATQ PMDC</td>
<td>7.27*</td>
<td>1, 175</td>
<td>5.29*</td>
</tr>
<tr>
<td>ATQ PMDC Log</td>
<td>8.40*</td>
<td>1, 175</td>
<td>6.99*</td>
</tr>
<tr>
<td>SCS Total</td>
<td>17.61*</td>
<td>1, 175</td>
<td>3.99</td>
</tr>
<tr>
<td>SCS Humanity</td>
<td>7.83*</td>
<td>1, 175</td>
<td>.97</td>
</tr>
<tr>
<td>SCS Isolation</td>
<td>5.14*</td>
<td>1, 175</td>
<td>5.15*</td>
</tr>
<tr>
<td>SCS Judgment</td>
<td>5.69*</td>
<td>1, 175</td>
<td>4.08*</td>
</tr>
<tr>
<td>SCS Kindness</td>
<td>5.08*</td>
<td>1, 175</td>
<td>.86</td>
</tr>
<tr>
<td>SCS Mindfulness</td>
<td>3.41</td>
<td>1, 175</td>
<td>.33</td>
</tr>
<tr>
<td>SCS</td>
<td>6.01*</td>
<td>1, 175</td>
<td>1.93</td>
</tr>
<tr>
<td>Overidentified</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>STAI S</td>
<td>55.71*</td>
<td>1, 175</td>
<td>.44</td>
</tr>
<tr>
<td>TMS Total</td>
<td>21.57*</td>
<td>1, 175</td>
<td>.61</td>
</tr>
<tr>
<td>TMS Curiosity</td>
<td>1.23</td>
<td>1, 175</td>
<td>.49</td>
</tr>
<tr>
<td>TMS Decentering</td>
<td>45.87*</td>
<td>1, 175</td>
<td>.51</td>
</tr>
<tr>
<td>VAS humanity</td>
<td>2.99</td>
<td>1, 175</td>
<td>4.36*</td>
</tr>
<tr>
<td>VAS kindness</td>
<td>.471</td>
<td>1, 175</td>
<td>2.68</td>
</tr>
<tr>
<td>VAS mindfulness</td>
<td>.10</td>
<td>1, 175</td>
<td>.79</td>
</tr>
</tbody>
</table>

Note. ATQ = Automatic Thoughts Questionnaire; LSE = Low Self Esteem Subscale; NSNE = Negative Self-Concepts and Negative Expectations Subscale; PMDC = Personal Maladjustment and Desire for Change Subscale; SCS = Self-Compassion Scale; STAIS = State-Trait Anxiety Inventory State Form; TMS = Toronto Mindfulness Scale; VAS = Visual Analog Scale

* = p < .05

Discussion

The literature on the beneficial effects of mindfulness is rapidly becoming overwhelming in breadth, but even with this large scale push to identify mindfulness as an empirically supported treatment, few researchers have evaluated differential efficacy or single-session effects. The current study had three aims, namely, to identify whether changes in mood can be detected after one session of meditation, whether the meditations actually target the processes they are intended to, and finally, to determine whether one form of meditation may be more beneficial than another.
Single-Session Meditation Effects on Mood

One of the most outstanding findings with regard to the present study was the fact that almost every measure moved in the predicted direction after the participants completed the meditation exercise. This finding reveals that even a single-session, 15 minute meditation experience can have an effect on an individual’s state anxiety, depressive thoughts, and experience of self-compassion. Across both conditions, state anxiety decreased, thoughts related to depression decreased, and self-compassion overall increased. With regard to the anxiety measures, participants began with clinical levels of state anxiety, but after the meditation, these levels were sub-clinical. This is a remarkable change for only one session of meditation given that most of the participants in the study had either never meditated before or only tried it a few times. This finding provides additional support for the use of meditation for the alleviation of negative mood states. Many of the previous meditation studies have been conducted with the intention of reducing negative mood states in clinical populations. The current study did not seek out a clinical population and additionally, conducted each meditation outside of a clinical setting. Although the clinical benefits of meditation have been demonstrated repeatedly, the present study adds to the literature of novice, non-clinical populations and suggests that meditation can be helpful for those learning meditation outside of a therapeutic setting. The implications for a college population are vast. Colleges may benefit from introducing meditation skills during freshman orientation or offer meditation groups during particularly stressful times such as finals weeks to help decrease anxiety related to test taking.

Cultivation of the Characteristics the Meditations Claim to Affect

With regard to the second aim of the study, it seemed as though both meditations demonstrated increases in mindfulness and self-compassion, thus validating their intended
purpose. Nevertheless, it was quite surprising to discover that the LKM did not have an advantage over breathing meditation with regard to increases in self-compassion. Given that the primary objective of LKM practice is to increase feelings of compassion for self and others, this lack of differential self-compassion scores seems to call into question the validity of the LKM practice. Although rarely mentioned in the popular literature on mindfulness, the results of the present study seem to lend support for the idea that a LKM practice may not be needed in addition to a breathing mindfulness practice in order to help an individual increase their feelings of compassion. Interestingly, in the present study, the breathing condition demonstrated an equal amount of increase in self-compassion which was an unexpected outcome. One of the primary explanations for this finding is that LKM seems to be considered a more “advanced” meditation technique usually taught after individuals have had experience with a traditional breathing meditation (Grossman, 2010). This is done to ensure that the meditator has the skill to observe and pay attention to the “anchor” (usually the breath) without getting too caught up in thought, thus allowing for the lovingkindness practice to be the sole focus of the meditation session. One of the great Western Buddhist scholars described her first experience with LKM as follows:

“So the first week I spent directing lovingkindness toward myself. I felt absolutely nothing. It was the dreariest, most boring week I had known in some time. I sat there saying, ‘May I be happy, may I be peaceful,’ over and over again with no obvious result… As I was hurriedly getting everything together in my bathroom, I dropped a jar. It shattered all over the floor. I still remember my immediate response: ‘You are really a klutz, but I love you.’ And then I thought, ‘Wow! Look at that. Something did happen in this week of practice.’” (Salzberg, 1995, pg.40).

Sharon Salzberg’s account suggests at an additional reason for why the LKM did not produce changes in self-compassion to a greater degree than those seen in the breathing meditation. As she so eloquently hints to in the above passage, self-compassion is a stance with yourself and is most accurately tested when you are placed in a situation in which you are not terribly pleased
with an action you just committed. Even for an experienced meditator like Salzberg, it seems as though the overt effects of LKM were not experienced until she was actually in a situation in which she was feeling particularly hard on herself. Thus, it could be the case that LKM cultivates self-compassion on a more covert level – one that is not accessed through mere self-report measures. It could therefore be hypothesized that acute effects of LKM are not yet measureable since they are outside of our conscious experience. More seasoned LKM practitioners would have had time to recognize the increased compassionate responding to their own behavior and thus would tend to score more highly on self-report measures of self-compassion, which is what you see in the literature (Hofmann et al., 2011).

On a related note, it is of importance to recognize the visual analog scales, which were designed to measure state fluctuations in self-compassion, did not produce any significant results for either condition. Two reasons emerge as possibilities. The first is that the scale did not adequately address the three facets of self-compassion and that face validity was low. The second is that the VAS could have been more effective for seasoned meditators to whom the more covert effects of the LKM would be much clearer, as they were to Salzberg when she experienced a situation that cultivated her awareness of her newly compassionate self by dropping the glass jar. It could be hypothesized then that in order for self-compassion to be realized, it first must be cultivated by means of a practice such as LKM and then it must be brought into conscious awareness through various experiences with the self. Only then will practitioners recognize that a change in self-relation has occurred. In regards to the present study, it would seem as though LKM is a practice that can cultivate a more compassionate way of responding, but the large scale changes in compassion only take place after the meditation has been practiced repeatedly and an event occurs that brings the new compassionate responding into
conscious awareness. This is largely speculation based on the current body of LKM literature, Buddhist teaching, and interpretation of the current findings. Future research would greatly benefit this area of exploration.

The question therefore remains: Why did the self-compassion scale show increases in self-compassion after only one 15-minute meditation session while the VAS produced no change? One hypothesis is that all meditations allow the meditators to gain a more clear understanding of who they truly are, or said another way, they develop an increased awareness into their own nature (Vago & David, 2012). Since the SCS primarily targets trait self-compassion, it could be postulated that the fluctuations in self-compassion were actually a result of increased awareness of the self and not necessarily actual increases in the feelings of self-compassion. Said another way, since this study was primarily composed of novice meditators, just experiencing a meditation could have altered their self-awareness. Hence, lower scores were seen on time 1 assessments because the meditation helped fine tune their self-awareness thus, when prompted with the same assessment in time 2, they were better able to respond in a way that seemed more in line with who they believe they are as a person. One of the key differences between the two scales is that the items on the SCS seem to reflect qualities of action whereas the VAS reflects more of a state of being. Therefore, if increased self-awareness was actually the culprit for the higher scores on self-compassion, then it would make sense that the VAS also did not demonstrate a change since the novice meditators would not yet have access to these covert processes taking place below their levels of awareness which ultimately affect their overall state of being. Future studies would benefit from including a measure of self-awareness as a covariate in order to account for these subtle changes.

**Differential Effects of LKM and Breathing Meditation**
Given that only one interaction effect was significant in the current study, it seems that it is difficult to make claims on the differential effects of the two meditations. Nevertheless, the one interaction effect that was found is an important one. According to the present study, the negative self-concepts and negative expectations subscale of the ATQ significantly improved in the breathing meditation and not in the LKM. This finding indicates that a single-session breathing meditation can have an impact on ones negative self-talk (i.e. “I’m no good”) and on hopes for the future (i.e. “I’ll never make it”). This is a profound finding and actually adds some evidence for the fact that maybe a shift in self-compassion was evident in the present study (i.e. there should be an inverse relation between negative self-concepts and self-compassion which is what the data reflect). Interestingly, this finding was only seen in the breathing condition making the breathing meditation seemingly more beneficial for single-session effects.

Looking at the structure of the LKM practice may elucidate why this effect was seen for breathing meditation and not for LKM. Overall, wisdom traditions teach LKM as an advanced practice and this has been validated by research done with extensive practices like Mindfulness-Based Stress Reduction (MBSR). In MBSR, participants are taught many different types of meditation before being instructed on how to do LKM and research has shown that this progression is effective in treating all sorts of ailments (Grossman, Niemann, Schmidt, Walach, 2004). Therefore, it seems that LKM is a very effective technique, but may be a technique in which advanced practitioners can reap the benefits more so than novices. When someone begins to meditate, a whole new world opens up to them: they begin to realize that thoughts are occurring at all hours and sometimes these thoughts are racing, fleeting, serious, or downright silly. No matter, the point is that this realization of being able to notice that you can notice your thinking is one that can shift an individual’s entire perspective on their mind and body. It is
precisely in this space of perspective taking (i.e. noticing that we can notice our thoughts) that we can begin to see the thoughts we are having and then decide whether they are helpful or unhelpful to us. Through mindfulness, we can learn to cultivate the space in which we are then able to let go of thoughts that are not helpful to our current state of being. If LKM is introduced before mindfulness has been taught and practiced, then the novice meditator may have a very difficult time letting go of difficult thoughts and redirecting their attention to the mantras they have been instructed to recite. Since they haven’t cultivated the skill of letting thoughts go, they may end up getting entangled in thinking and losing sight of the helpful mantras. Additionally, they may have a difficult time even noticing that they are caught up in thought because one of the primary outcomes of meditation is noticing that you are indeed caught in thought. Therefore, LKM can be thought of as an advanced practice because without the cultivation of perspective on your own mind, the practitioner could find it difficult to maintain focus on the mantras without getting caught in the struggle with intrusive thoughts, thus making the cultivation of a compassionate state much more difficult.

It seems that the characteristics of LKM, although very powerful for the seasoned meditator, may actually be difficult for the novice to resolve. For example, the instructions of LKM request that you offer yourself loving wishes which can be very challenging for many people to do. In fact, many people who start LKM struggle with offering loving phrases to themselves and have to work up to this action by first offering the phrases to a caring other or even a pet (Germer, 2009). Relational frame theory (RFT; Hayes, Barnes-Holmes, & Roche, 2001) provides wonderful insight into why this might be so. RFT posits that language is intimately relational and these relations are learned through various interactions with our environment. The relational frames (or language connections), however, do not discriminate
between what you “should” be thinking in a given context and what you actually end up thinking because of your learning history. For example, in the present study, participants in the LKM condition were supposed to be cultivating a stance of loving feelings toward themselves. If a participant begins to wish themselves love or happiness and their learning history is one that suggests that they do not deserve love and happiness, the thoughts of “I don’t deserve love” will be part of the relational frame of “May I have love.” This is referred to as a frame of opposition – one in which the opposite of what you are trying to think ends up in your mind. In regards to the current study, participants may have had a difficult time with LKM due to a frame of opposition being triggered. Every time they thought the wish “May I have love” the thought “I am not deserving of love” or something like it may have shown up. This is why it is important to cultivate the conditions of mindful awareness before attempting a LKM practice. Those who are able to hold their thoughts in mindful awareness would be better able to “let go” of the negatively skewed thoughts triggered by the frame of opposition and refocus their attention on the mantra. Future research could evaluate this more thoroughly to determine if in fact a frame of opposition is interfering with the novice LKM practitioner.

**Additional Considerations**

Although not explicitly outlined in the procedures, it is important to mention that the setting with which this study took place was not exactly ideal for meditation. When one thinks of places to meditate, the image is usually something like a peaceful and serene environment with incense burning and jewel-toned velvet throw pillows surrounding a luxurious zafu or zabuton. This is far from what the participants in this study received. First, the meditations occurred in group format with up to 15 people in one room meditating together. Second, the room was a computer lab on the first floor of a busy college building. There was often loud
noises coming from both outside the building (the window side) and inside the building (the hallway side). Finally, the lights were not dimmed and they were sitting facing a personal computer screen which was also contributing to light pollution in their immediate space. Given these conditions, this room would be a difficult place for even a seasoned meditator to meditate. Therefore, it is quite remarkable that novices were able to report benefits from the meditation in such a challenging environment. This fact greatly contributes to the robust nature of the findings and could imply that larger differences from pre- to post-test may be evident given a more “meditation friendly” environment.

Another interesting point to consider is the importance of the “believability” variable. In the current study, participants were asked whether they believed meditation can be a helpful practice. This question was left open-ended (i.e. helpful was not operationalized) and even in doing so, this question was shown to be highly correlated with most of the outcome measures. This result seems to suggest that believability in the efficacy of the meditation can have a powerful effect on the outcomes of the meditation. This finding is not surprising given that expectancy research has been conducted for decades and has reliably shown that beliefs at pre-treatment can be some of the strongest predictors of treatment outcome (Kirsch, 1985). Expectancies or believability plays a key role when evaluating clinical interventions because it seems that the expectancies we hold pre-treatment will be largely validated at post-treatment regardless of what the intervention was. In other words, we tend to seek validation of our pre-treatment expectations, therefore potentially creating a barrier for clinically significant change. This is particularly true for individuals who hold very strong positive expectancies or negative expectancies. Therefore, it is likely that the individuals in this study who rated the meditation as highly effective and very positive have positive expectations with regard to meditation to begin
with. Although expectancies were not specifically addressed in this study, it seems as though controlling for an expectancy or believability variable is quite important when determining the validity of any clinical intervention study. Future research would benefit from exploring the degree to which believability in a meditation can alter its perceived effectiveness.

**Limitations and Future Directions**

Although the above results provide interesting insights, they should be interpreted within the realm of several limitations. First, the study was conducted on a college student population which makes generalizability to the population at large questionable. Additionally, 50% of the present sample identified as White thus largely reflecting this ethnicity’s experience with the meditation. Future studies should seek to evaluate a more diverse sample, both in terms of age and ethnicity.

Second, the study was large comprised of novice meditators. Although this adds support for the effects of meditation for novices, it still may have limited the degree to which the outcome measures were affected. It would be interesting to run a similar study in which more experienced meditators are given the same test battery before and after a meditation session and then compare the more advanced meditators to the novices.

Third, many meditation scholars suggest that novice meditators start with shorter meditation sessions and then build up to 15-20 minutes sessions (Salzberg, 2011). Due to the nature of the present study, this was not ideal. Therefore, given that the sample was mostly novice meditators, it could be possible that they found the 15 minute meditation to be too demanding for a first experience. The present study attempted to account for this by including various items related to their attitudes toward the meditation, but this may not have adequately covered the discomfort experienced from sitting in meditation for 15 minutes. Future studies
may consider inoculating participants by gradually introducing them to meditation through shorter version first. Additionally, it would be interesting to see if the same effects were evident for a 5 minute meditation session for novice meditators and to more closely evaluate the effects of the meditation length.

Fourth, nearly all of the assessments in the present battery were self-report in nature. The one behavioral measure (i.e. how many meditation scripts were taken at the end of the session) revealed that either there was a large discrepancy between what participants reported in the assessment battery and how they really felt about the meditation or that there are additional factors that motivate one to actually take a meditation script. Due to the anonymous nature of the data collection process, it was not possible to analyze variables that could be related to whether someone took a script or not. The field of meditation and self-compassion research has an enormous deficit when it comes to behavioral measures of the related outcome measures. In fact, this writer was unable to find any in the current state of the literature. Future research would greatly benefit from having a behavioral measure of self-compassion and mindfulness seeing as how the literature to date has only relied on self-report assessments. In particular, future research could use a behavioral measure to sparse out the difference between the overt and covert effects of LKM or even a traditional breathing meditation. There is much room for creativity in this realm and the field is in desperate need of it.

As previously mentioned, one of the potential limiting factors to the present study was the inability to assess for a frame of opposition being triggered by the LKM. Thus, it is unclear as to which, if any, interfering mechanisms were present during the meditation itself. Although LKM has been taught as an advanced practice for centuries, it would still benefit the meditation community to provide scientific evidence for this statement and to elucidate the mechanism
which makes this meditation seemingly more advanced. Future studies could be simple in design and rich with information. For example, participants could be given a pre-test assessment battery which contains measures such as the Self-Compassion Scale, the State-Trait Anxiety Inventory, and one of the many assessments that evaluates mindfulness. Once completed, the participant could then be asked what immediately comes to mind when they hear three of the LKM phrases. The research assistant would then state the phrases (i.e. “May I have peace, may I have love,” etc.) and invite the participant to state what immediately showed up in their mind when they heard those phrases. The research assistant could then code the participants responses as within the realm of an oppositional frame (i.e. “I wish I had those things”) or within the realm of a non-oppositional frame (i.e. “That’s nice” or experiencing no thoughts, etc.). Given that LKM is supposed to help an individual cultivate self-compassion, it would be reasonable to hypothesize that participants with higher self-compassion scores would be less triggered by the LKM phrases and therefore exhibit fewer frames of opposition when asked about the phrases. The results of this type of study could help elucidate the mechanism that makes LKM a more advanced practice by taking into account baseline levels of self-compassion, mindful awareness, and various mood variables such as anxiety. Additionally, a study of this kind could contribute largely to the clinical literature by providing evidence for the fact that LKM may be very difficult for those experiencing clinically relevant levels of low self-compassion and high anxiety. Thus, a mindfulness meditation may have to be introduced before beginning work on self-compassion. In other words, it could reveal that trying to boost a client’s self-compassion may be counter-productive if they are not able to hold their negative self-evaluations in mindful awareness.
Finally, self-awareness was not measured in the present study. Although this may not have a dramatic effect on the mindfulness outcome measures, this may have had an effect on the mood and self-compassion measures. Future studies should include a measure of self-awareness in order to account for any mood-state fluctuations that occur primarily as a result of just increased self-awareness and not purely from the meditation itself.

The present study sought to add to a deficit in the single-session, non-clinical meditation research. This was achieved by demonstrating that a single-session meditation can benefit novice meditators with regard to their mood and self-compassion. This study also revealed what Buddhist scholars have been teaching for years (Germer, 2009), namely that a general awareness meditation (such as breathing) should be taught before LKM in order to help the meditator cultivate the awareness and ability to “let go” of difficult thoughts. Finally, the present study revealed that breathing meditation may have more of an advantage over LKM for novice meditators and provide a more enjoyable and impactful experience for these novices. It seems that the present study adds support to what ancient mystics and sages have known for years:

“Buddah was asked, ‘What have you gained from meditation?’
He replied, ‘Nothing! However.’
Buddah said, ‘let me tell you what I lost:
Anger, Anxiety, Depression, insecurity, Fear of
Old age and Death.’” ~ Unknown

References
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APPENDIX A - MEASURES

Automatic Thoughts Questionnaire (ATQ)

Listed below are a variety of thoughts that pop into people’s heads. Please read each thought and indicate how frequently, if at all, the thought occurred to you over the last week. Please read each item carefully and fill in the blank with the appropriate number, using the following scale:

1 = Not at all
2 = Sometimes
3 = Moderately often
4 = Often
5 = All the time

___ 1. I feel like I’m up against the world.
___ 2. I’m no good.
___ 3. Why can’t I ever succeed.
___ 4. No one understands me.
___ 5. I’ve let people down.
___ 6. I don’t think I can go on.
___ 7. I wish I were a better person.
___ 8. I’m so weak.
___ 9. My life is not going the way I want it to.
___ 10. I’m so disappointed in myself.
___ 12. I can’t stand this anymore.
___ 13. I can’t get started.
___ 14. What’s wrong with me?
___ 15. I wish I were somewhere else.
___ 16. I can’t get things together.
___ 17. I hate myself.
___ 18. I’m worthless.
19. Wish I could just disappear.
20. What’s the matter with me?
21. I’m a loser
22. My life is a mess.
23. I’m a failure.
24. I’ll never make it.
25. I feel so helpless.
26. Something has to change.
27. There must be something wrong with me.
28. My future is bleak.
29. It’s just no worth it.
30. I can’t finish anything.
Demographics

What is your age?

What is your biological sex?  () Male  () Female

What is your ethnicity?
() White
() Black or African American
() Asian or Pacific Islander
() Hispanic or Latino
() Native American
() Other (please specify)

What year are you in college?  () Freshman
() Sophomore
() Junior
() Senior

What is your experience with mindfulness meditation?
() I have never meditated
() I’ve tried meditation a couple of times
() I meditate a few times per year
() I meditate once per month
() I meditate several times per week
() I have a daily meditate practice
() I don’t have a formal meditate practice but I incorporate it throughout my day
() I tend to yo-yo (meditate frequently, stop for a period of time, meditate frequently, etc.)
() Other (please specify)

Do you participate in yoga?  () Yes  () No

If yes, how often do you practice yoga?
() Once a year
() Every few months
() A few times every month
() A few times every week
() Daily
() Other (please specify)

Please describe and holistic practices that you engage in here: (i.e. specific form of meditation, mindful activities, specific form of yoga, daily prayers, etc.)
Meditation Engagement and Attitudes

1. Did you actually try to do the meditation?
   () I tried to stay engaged with the meditation for the whole time
   () I tried to stay engaged with the meditation but eventually gave up
   () I didn’t even try to do it

2. How much did you like the meditation?
   () 1 – I really liked it a lot!
   () 2
   () 3
   () 4
   () 5 – I neither liked it nor disliked it
   () 6
   () 7
   () 8
   () 9
   () 10 – I absolutely hated it

3. Would you do this meditation again?
   () Yes
   () No

4. Would you recommend this meditation to a friend?
   () Yes
   () No
5. Have you ever heard of mindfulness or lovingkindness meditation?
   () I’ve heard of both mindfulness and lovingkindness meditation
   () I’ve only heard of mindfulness meditation
   () I’ve only heard of lovingkindness meditation
   () I haven’t heard of either

6. Do you believe that meditation can be helpful?
   () I believe meditation can be helpful
   () I believe meditation can be helpful to other people but not for myself
   () I don’t think meditation is helpful for anyone
   () I don’t know

7. Do you think that meditation is a legitimate practice?
   () Yes
   () I’m not sure
   () No

8. What is your general attitude toward meditation?
   () 1 – Very negative… I think it’s stupid/don’t like it at all
   () 2
   () 3
   () 4
   () 5 – Neutral … I don’t have a positive or negative attitude toward meditation
   () 6
   () 7
   () 8
   () 9
   () 10 – Very positive … I think meditation is a great practice!
Self-Compassion Scale

DIRECTIONS: Please read each statement carefully before answering then, indicate how often you behave in the stated manner

1. I am disapproving and judgmental about my own flaws and inadequacies
   () 1 Almost Never () 2 () 3 () 4 () 5 Almost Always

2. When I am feeling down I tend to obsess and fixate on everything that’s wrong
   () 1 Almost Never () 2 () 3 () 4 () 5 Almost Always

3. When things are going badly for me, I see the difficulties as part of life that everyone goes through
   () 1 Almost Never () 2 () 3 () 4 () 5 Almost Always

4. When I think about my inadequacies, it tend to make me feel more separate and cut off from the rest of the world
   () 1 Almost Never () 2 () 3 () 4 () 5 Almost Always

5. I try to be loving towards myself when I’m feeling emotional pain
   () 1 Almost Never () 2 () 3 () 4 () 5 Almost Always

6. When I fail at something important to me I become consumed by feelings of inadequacy
   () 1 Almost Never () 2 () 3 () 4 () 5 Almost Always

7. When I’m feeling down and out, I remind myself that there are lots of other people in the world feeling like I am
   () 1 Almost Never () 2 () 3 () 4 () 5 Almost Always

8. When times are really difficult, I tend to be tough on myself
   () 1 Almost Never () 2 () 3 () 4 () 5 Almost Always

9. When something upsets me I try to keep my emotions in balance
   () 1 Almost Never () 2 () 3 () 4 () 5 Almost Always

10. When I feel inadequate in some way, I try to remind myself that feelings of inadequacy are shared by most people
    () 1 Almost Never () 2 () 3 () 4 () 5 Almost Always

11. I’m intolerant and impatient towards those aspects of my personality I don’t like
    () 1 Almost Never () 2 () 3 () 4 () 5 Almost Always
12. When I’m going through a very hard time, I give myself the caring tenderness I need

( ) 1 Almost Never  ( ) 2  ( ) 3  ( ) 4  ( ) 5 Almost Always

13. When I’m feeling down, I tend to feel like most other people are probably happier than I am

( ) 1 Almost Never  ( ) 2  ( ) 3  ( ) 4  ( ) 5 Almost Always

14. When something painful happens I try to take a balanced view of the situation

( ) 1 Almost Never  ( ) 2  ( ) 3  ( ) 4  ( ) 5 Almost Always

15. I try to see my failings as part of the human condition

( ) 1 Almost Never  ( ) 2  ( ) 3  ( ) 4  ( ) 5 Almost Always

16. When I see aspects of myself that I don’t like, I get down on myself

( ) 1 Almost Never  ( ) 2  ( ) 3  ( ) 4  ( ) 5 Almost Always

17. When I fail at something important to me I try to keep things in perspective

( ) 1 Almost Never  ( ) 2  ( ) 3  ( ) 4  ( ) 5 Almost Always

18. When I’m really struggling, I tend to feel like other people must be having an easier time of it

( ) 1 Almost Never  ( ) 2  ( ) 3  ( ) 4  ( ) 5 Almost Always

19. I’m kind to myself when I’m experiencing suffering

( ) 1 Almost Never  ( ) 2  ( ) 3  ( ) 4  ( ) 5 Almost Always

20. When something upsets me I get carried away with my feelings

( ) 1 Almost Never  ( ) 2  ( ) 3  ( ) 4  ( ) 5 Almost Always

21. I can be a bit cold-hearted towards myself when I am experiencing suffering

( ) 1 Almost Never  ( ) 2  ( ) 3  ( ) 4  ( ) 5 Almost Always

22. When I’m feeling down I try to approach my feelings with curiosity and openness

( ) 1 Almost Never  ( ) 2  ( ) 3  ( ) 4  ( ) 5 Almost Always

23. I’m tolerant of my own flaws and inadequacies

( ) 1 Almost Never  ( ) 2  ( ) 3  ( ) 4  ( ) 5 Almost Always

24. When something painful happens I tend to blows the incident out of proportion

( ) 1 Almost Never  ( ) 2  ( ) 3  ( ) 4  ( ) 5 Almost Always

25. When I fail at something that’s important to me, I tend to feel alone in my failure
26. I try to be understanding and patient towards those aspects of my personality I don’t like

() 1 Almost Never  () 2  () 3  () 4  () 5 Almost Always
Social Desirability Scale

Listed below are a number of statements concerning personal attitudes and traits. Read each item and decide whether the statement is true or false as it pertains to you personally.

1. It is sometimes hard for me to go on with my work if I am not encouraged
   ( ) True ( ) False

2. I sometimes feel resentful when I don't get my way
   ( ) True ( ) False

3. On a few occasions, I have given up doing something because I thought too little of my ability
   ( ) True ( ) False

4. There have been times when I felt like rebelling against people in authority even though I knew they were right
   ( ) True ( ) False

5. No matter who I'm talking to, I'm always a good listener
   ( ) True ( ) False

6. There have been occasions when I took advantage of someone
   ( ) True ( ) False

7. I'm always willing to admit it when I make a mistake
   ( ) True ( ) False

8. I sometimes try to get even rather than forgive and forget
   ( ) True ( ) False

9. I am always courteous, even to people who are disagreeable
   ( ) True ( ) False

10. I have never been irked when people expressed ideas very different from my own
    ( ) True ( ) False
11. There have been times when I was quite jealous of the good fortune of others
   ( ) True   ( ) False

12. I am sometimes irritated by people who ask favors of me
   ( ) True   ( ) False

13. I have never deliberately said something that hurt someone's feelings
   ( ) True   ( ) False
State-Trait Anxiety Inventory – State

DIRECTIONS: A number of statements which people have used to describe themselves are given below. Read each statement and then select the appropriate response to indicate how you GENERALLY FEEL. Do not spend too much time on any one statement but give the answer which seems how you GENERALLY FEEL.

1. I feel pleasant
   () Almost Never () Sometimes () Often () Almost Always

2. I feel nervous and restless
   () Almost Never () Sometimes () Often () Almost Always

3. I feel satisfied with myself
   () Almost Never () Sometimes () Often () Almost Always

4. I wish I could be as happy as others seem to be
   () Almost Never () Sometimes () Often () Almost Always

5. I feel like a failure
   () Almost Never () Sometimes () Often () Almost Always

6. I feel rested
   () Almost Never () Sometimes () Often () Almost Always

7. I am “cool, calm, and collected”
   () Almost Never () Sometimes () Often () Almost Always

8. I feel that difficulties are piling up so that I cannot overcome them
   () Almost Never () Sometimes () Often () Almost Always

9. I worry too much over something that doesn’t really matter
   () Almost Never () Sometimes () Often () Almost Always

10. I am happy
    () Almost Never () Sometimes () Often () Almost Always

11. I have disturbing thoughts
    () Almost Never () Sometimes () Often () Almost Always
12. I lack self-confidence
   () Almost Never () Sometimes () Often () Almost Always

13. I feel secure
   () Almost Never () Sometimes () Often () Almost Always

14. I make decisions easily
   () Almost Never () Sometimes () Often () Almost Always

15. I feel inadequate
   () Almost Never () Sometimes () Often () Almost Always

16. I am content
   () Almost Never () Sometimes () Often () Almost Always

17. Some unimportant thought runs through my mind and bothers me
   () Almost Never () Sometimes () Often () Almost Always

18. I take disappointments so hard that I can’t put them out of my mind
   () Almost Never () Sometimes () Often () Almost Always

19. I am a steady person
   () Almost Never () Sometimes () Often () Almost Always

20. I get in a state of tension or turmoil as I think over my recent concerns and interests
   () Almost Never () Sometimes () Often () Almost Always
State-Trait Anxiety Inventory – Trait Form

DIRECTIONS: A number of statements which people have used to describe themselves are given below. Read each statement and then select the appropriate response for how you feel RIGHT NOW, that is, AT THIS MOMENT. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best.

1. I feel calm
   () Not at all   () Somewhat   () Moderately So   () Very much so

2. I feel secure
   () Not at all   () Somewhat   () Moderately So   () Very much so

3. I am tense
   () Not at all   () Somewhat   () Moderately So   () Very much so

4. I feel strained
   () Not at all   () Somewhat   () Moderately So   () Very much so

5. I feel at ease
   () Not at all   () Somewhat   () Moderately So   () Very much so

6. I feel upset
   () Not at all   () Somewhat   () Moderately So   () Very much so

7. I am presently worrying over possible misfortunes
   () Not at all   () Somewhat   () Moderately So   () Very much so

8. I feel satisfied
   () Not at all   () Somewhat   () Moderately So   () Very much so

9. I feel frightened
   () Not at all   () Somewhat   () Moderately So   () Very much so

10. I feel comfortable
    () Not at all   () Somewhat   () Moderately So   () Very much so

11. I feel self-confident
    () Not at all   () Somewhat   () Moderately So   () Very much so
12. I feel nervous
   () Not at all  () Somewhat  () Moderately So  () Very much so
13. I am jittery
   () Not at all  () Somewhat  () Moderately So  () Very much so
14. I feel indecisive
   () Not at all  () Somewhat  () Moderately So  () Very much so
15. I am relaxed
   () Not at all  () Somewhat  () Moderately So  () Very much so
16. I feel content
   () Not at all  () Somewhat  () Moderately So  () Very much so
17. I am worried
   () Not at all  () Somewhat  () Moderately So  () Very much so
18. I feel confused
   () Not at all  () Somewhat  () Moderately So  () Very much so
19. I feel steady
   () Not at all  () Somewhat  () Moderately So  () Very much so
20. I feel pleasant
   () Not at all  () Somewhat  () Moderately So  () Very much so
Toronto Mindfulness Scale – PRE-TEST

DIRECTIONS: We are interested in what you just experienced before entering the testing room. Below is a list of things that people sometimes experience. Please read each statement. Next to each statement are five choices: “not at all,” “a little,” “moderately,” “quite a bit,” and “very much.” Please indicate the extent to which you agree with each statement. In other words, how well does the statement describe what you just experienced, before entering the testing room?

1. I experienced myself as separate from my changing thoughts and feelings
   ( ) Not at all ( ) A little ( ) Moderately ( ) Quite a bit ( ) Very much

2. I was more concerned with being open to my experiences than controlling or changing them
   ( ) Not at all ( ) A little ( ) Moderately ( ) Quite a bit ( ) Very much

3. I was curious about what I might learn about myself by taking notice of how I react to certain thoughts, feelings, or sensations
   ( ) Not at all ( ) A little ( ) Moderately ( ) Quite a bit ( ) Very much

4. I experienced my thoughts more as events in my mind than as a necessarily accurate reflection of the way things ‘really’ are
   ( ) Not at all ( ) A little ( ) Moderately ( ) Quite a bit ( ) Very much

5. I was curious to see what my mind was up to from moment to moment
   ( ) Not at all ( ) A little ( ) Moderately ( ) Quite a bit ( ) Very much

6. I was curious about each of the thoughts and feelings that I was having
   ( ) Not at all ( ) A little ( ) Moderately ( ) Quite a bit ( ) Very much

7. I was receptive to observing unpleasant thoughts and feelings without interfering with them
   ( ) Not at all ( ) A little ( ) Moderately ( ) Quite a bit ( ) Very much

8. I was more invested in just watching my experiences as they arose, than in figuring out what they could mean
   ( ) Not at all ( ) A little ( ) Moderately ( ) Quite a bit ( ) Very much

9. I approached each experience by trying to accept it, no matter whether it was pleasant or unpleasant
   ( ) Not at all ( ) A little ( ) Moderately ( ) Quite a bit ( ) Very much

10. I remained curious about the nature of each experience as it arose
    ( ) Not at all ( ) A little ( ) Moderately ( ) Quite a bit ( ) Very much

11. I was aware of my thoughts and feelings without over identifying with them
() Not at all  () A little  () Moderately  () Quite a bit  () Very much

12. I was curious about my reactions to things

() Not at all  () A little  () Moderately  () Quite a bit  () Very much

13. I was curious about what I might learn about myself by just taking notice of what my attention gets drawn to

() Not at all  () A little  () Moderately  () Quite a bit  () Very much

Toronto Mindfulness Scale – POST TEST

DIRECTIONS: We are interested in what you just experienced. Below is a list of things that people sometimes experience. Please read each statement. Next to each statement are five choices: “not at all,” “a little,” “moderately,” “quite a bit,” and “very much.” Please indicate the extent to which you agree with each statement. In other words, how well does the statement describe what you just experienced, just now?

All items and response options will be the same as the pre-test version
Visual Analog Scales

Thinking about how you are experiencing yourself now, in this moment, please mark where you would fall between the two points:

1. I am harsh on myself - - - - - - - - - - - - - - - - - - - - - - - - - - I am gentle and kind with myself
2. I feel disconnected from others - - - - - - - - - - - - - - - - - - I feel connected to others
3. I am my thoughts and have a hard time noticing that they are separate from my sense of self - - - - - - - - - - I am able to noticed my thoughts as thoughts and that they are separate from my sense of self.
APPENDIX B – MEDITATION SCRIPTS

Instructions for Breathing Meditation Condition (2 mins 51 secs)

*Note: Instructions are pre-recorded so all breathing meditation groups will hear the same instructions, from the same person (Sharon Salzberg – a well respected meditation instructor), for the same duration.*

The classic foundational exercise in developing meditation practice is focusing on the feeling of the in and out breath. They say the breath is chosen for lots of different reasons. For one thing, you don’t have to believe anything in order to feel your breath. You don’t have to call yourself a Buddhist or a Hindu. You don’t have to reject anything. You don’t have to adopt a dogma. If you’re breathing you can be meditating. As you sit making the effort to steady your attention on the feeling of the breath inevitably thoughts and feelings will arise. They’ll come, they’ll claim our attention and what we are practicing is repeatedly noticing them and simply letting them go. Having let go of the distraction, we return our attention to the primary object or the feeling of the breath. Some of the thoughts and feelings that come are fantastic, they’re fascinating, they’re delightful, some might make us uncomfortable, some are kind of surprising, some are pretty dull. We practice letting them all go without judging them, without disparaging ourselves for what we’re experiencing, without condemning ourselves…we let go and we bring our attention back. This ability to let go and begin again is the crucial step in becoming more centered and more present. Almost immediately we feel the healing power of being able to begin again. No matter where our attention has gone or for how long, nothing’s ruined, nothing’s lost. We can always, always begin again. Everyone who meditates, both complete beginners, long-term practitioners, gets high jacked by thoughts and feelings. It’s just impossible not to. But it’s completely possible to start over. Wherever we’ve gone, we can begin again. It’s not a sign of failure. It’s not remedial practice this is the practice. This ability to let go and begin again is the kind of fruit that we take into our ordinary life. We might stray from our chosen course but realize that we can begin again. We might lose sight of our aspiration but realize that we can begin again. We might make a mistake but realize that we can begin again.
Breathing Meditation (14 minutes 28 seconds)

Note: This meditation is pre-recorded so all participants will receive the exact same meditation with the same pacing and delivered from the same person (Sharon Salzberg).

(A bell dings to signify the beginning of the meditation) You can sit comfortably on a cushion or in a chair. See if you can keep your back erect but without being strained or overarched. And if you can’t sit you can lie on your back, on a yoga mat, or folded blanket with your arms at your sides. You can close your eyes if you’re comfortable with that. If not, or you’re more familiar with meditating with your eyes open that’s fine. With eyes open you can gaze gently a few feet in front of you, find a spot, rest your gaze, let it go. (Pause 5 seconds) You can deliberately take three or four deep breaths. Feel the air as it enters your nostrils, fills your chest and abdomen, and then flows out again. (Pause for 35 seconds) Then let your breath settle into its natural rhythm, without forcing it or trying to control it. (Pause for 10 seconds) Just feel the breath as it happens without trying to change it or improve it (Pause for 15 seconds) Notice where you feel your breath most vividly, most predominantly. Maybe it’s the in and out movement of air at the nostrils. Maybe it’s the rising falling movement of the chest or abdomen. You can find that place, bring your attention there and just rest. Rest your attention lightly, the way a butterfly rests on a flower, and see if you can feel just one breath without concern for what’s already gone by, without leaning forward for even the very next breath. Just this one. (Pause 15 seconds) Be aware of the sensations of the breath. If you’re at the nostrils, for example, you may feel tingling, vibration, warmth, coolness. If you’re at the abdomen or the chest you may feel movement, pressure, stretching, release. You don’t need to name these sensations, but feel them. (Pause 15 seconds) Just let your attention rest on the feeling of the natural breath, one breath at a time. (Pause 40 seconds) To help support the awareness of the breath, you might want to experiment with silently saying to yourself “in” “out.” Or perhaps “rising” “falling.” But very quietly so that what you’re resting your attention on is really the sensations, the feeling of the breath. Using the words as just a support (Pause for 15 seconds) And if thoughts or images or emotions or sensations should arise and they’re not strong enough to actually take your attention away from the breath, just let them flow on by. You’re breathing. (Pause for 15 seconds) They can come and go without your chasing after them to hold on or push away. It’s likened to seeing a friend in a crowd. You don’t have to shove aside everyone else to say go away…but your interest, your enthusiasm is going “Oh there’s my friend, there’s the breath, there’s the breath.” Everything else can come and go, doesn’t matter. There’s the breath. (Pause for 60 seconds) But if something arises that is strong enough to take your attention away, or you fall asleep or you get lost in thought, don’t worry about it. The moment that we realize our attention has wandered is the magic moment of the practice because that’s the moment we have the change to be really different. So that instead of judging ourselves and berating ourselves and condemning ourselves, we can be gently with ourselves, we can be kind. Simply let go and see if you can begin again. Bring your attention back to the feeling of the breath (Pause 60 seconds) And if you have to let go and begin again over and over again it’s fine. That’s the practice. You don’t
have to get mad at yourself for having a thought. You don’t have to evaluate its content. Just realize that you’ve been lost, gently let go, and bring your attention back. If you find yourself getting distracted by thoughts, you can think of those thoughts as clouds moving across a vast sky. The clouds aren’t the sky and actually the sky remains unchanged by them…however many there are, whatever they look like. Rather than get attached to any one thought, you can just let your thoughts float by, just like clouds moving through the sky. If you feel sleepy, you can sit up straighter, maybe open your eyes if they’ve been closed. Again take a few deep breaths and return to breathing naturally. You don’t need to control the breath or make it different from the way it is, simply be with it. Feel the beginning of the in breath and the end of it. Beginning of the out breath and the end of it. If you realize you’ve been distracted or you’ve fallen asleep, don’t tell yourself you’re weak or undisciplined, don’t give up in frustration, but practice letting go and beginning again. And when you feel ready, you can open your eyes or lift your gaze. As you finish this meditation session, reflect on the fact that you can bring some of these same qualities of concentration that you just experienced presence, calm observation, willingness to start over, gentleness, forgiveness to the next activity that you do at home, at work, among friends, among strangers.
Instructions for Loving Kindness Meditation (4 mins 48 secs)

Note: Instructions are pre-recorded so all loving kindness meditation groups will hear the same instructions, from the same person (Sharon Salzberg – a well respected meditation instructor), for the same duration.

Loving kindness is a meditation practice that’s a way of experimenting with our attention. What we pay attention to? Who do we pay attention to? How do we pay attention? For example, if we’re in the habit of fixating on what we’ve done wrong, the thing we didn’t say right, the action we didn’t do quite right, the exercise of loving kindness or the experiment of loving kindness would be to also open to the good within us. It’s not trying to pretend that everything is good, everything is perfect, that we have no problems, no issues. But we can have a fuller and actually more true picture of who we are. A picture that’s more realistic, more whole, rather than just obsessing about the things we’ve done wrong. If we’re in the habit of paying attention to some and disregarding others, discounting them, looking right through them, ignoring them, whether other people or creatures other forms of life. In loving kindness practice we stop. We pay more full attention. We open to these others. We take an interest in them. If we’re in the habit of being half-hearted, so that maybe we’re in conversation with somebody and not really listening and we’re thinking about the next person we need to speak to, the phone call we need to make, the email we need to send – here too we can stop. We can gather our attention, we can be much more fully present. This is loving kindness. So rather than seeing it as a meditation where we’re trying to pretend we’re feeling something we’re actually not, or that we like everybody when we really don’t, it’s an exercise in attention. Learning to be more fully present, to open more completely to ourselves and to others, to be willing to step out of a rut of habit, being willing to look at ourselves and our relationship to others in a different way. The practice of loving kindness meditation is done by silently repeating certain phrases. These phrases are the expressions of the heart, wishing well for ourselves or for others. We’re not trying to manufacture or fabricate a certain emotion or feeling. The power of the practice is in the gathering of all of our attention, all of our energy behind each phrase. We offer the phrases of loving kindness at first to ourselves, and then through a variety of different relationships, different beings and we close with the offering of loving kindness to all beings everywhere, to the boundlessness of life. What we do in the middle between ourselves and all beings may vary day to day. Perhaps we feel very grateful to someone so we’re sure to include them. Perhaps we know someone who’s really hurting, so we include them. Maybe we’re very uneasy about a meeting that’s upcoming with someone and we include them. Customary phrases are usually variations on, beginning with ourselves, May I be safe…May I be happy…May I be healthy…May I live with ease. This last “May I live with ease” means that in the things of day to day life like livelihood and family, may it not be a struggle. May I live with ease. The construct of “may I” is not meant to be begging or beseeching but is said to be in the spirit of generosity or blessing, both to ourselves and to others. May I be happy. May you be happy. The touchstone in this practice is the repetition of the phrases. If you find your mind wandering,
simply let go and begin again. Bring your attention back to the phrases. You can let thoughts, memories, emotions arise and pass away. You don’t have to follow after them. You don’t have to attack them. We steady our attention by coming back to the phrases.
Loving Kindness Meditation (15 mins 03 secs)

Note: This meditation is pre-recorded so all participants will receive the exact same meditation with the same pacing and delivered from the same person (Sharon Salzberg).

[A bell dings signifying the beginning of the meditation] You can sit or lie down comfortably on your back. Your eyes can be open or closed, however you feel most at ease. And we begin by offering loving kindness to ourselves by silently repeating phrases like “May I be safe…be happy…be healthy…live with ease.” You can find these phrases or three or four phrases that are meaningful to you. Repeat them with enough space and enough silence so that it’s a rhythm that’s pleasing to you. This is like the song of the heart. It’s just one phrase at a time with all of your attention gathering behind that one phrase. May I be safe…be happy…be healthy…live with ease… or whatever phrases you may be using. (Pause 15 seconds) If you find your attention wandering, don’t worry about it. You can simply let go of distractions and begin again. Feelings, thoughts, or memories might come and go. You can allow them to arise and pass away. Here the anchor’s not your breath but the repetition of these phrases. May I be safe…be happy…be healthy…live with ease. (Pause for 60 seconds) And you can call to mind someone who’s helped you. They’ve been good to you or kind to you or maybe you’ve never met them but they’ve inspired you. If someone like that comes to mind bring them here. You can get an image of them, say their name to yourself, get a feeling of their presence and offer the phrases of loving kindness to them. You can wish for them just what it is you wished for yourself. Maybe it’s an adult, maybe it’s a child, maybe it’s an animal. Someone, when you think of them, you smile. If there’s someone like that, that comes to mind you can begin directing the phrases to them. May you be safe…be happy…be healthy…live with ease. (Pause for 20 seconds) Even if the words don’t fit totally, it doesn’t matter. They’re the conduits of your heart, they’re the vehicle for connection. May you be safe…be happy…be healthy…live with ease. (Pause for 60 seconds) Call to mind someone you know who’s hurting, who’s having a difficult time right now. You can get an image of them, say their name to yourself, get a feeling of their presence and offer the phrases of loving kindness to them. May you be safe…be happy…be healthy…live with ease. (Pause for 60 seconds) And if you find your attention wandering, you don’t have to be discouraged. Just gently let go and return your attention to the phrases one phrase at a time. (Pause for 20 seconds) You can call to mind someone you might encounter just now and then – a neighbor, maybe someone you see when you walk your dog. Perhaps you don’t even know their name, but you can picture them, get a feeling of their presence. You might not know much or anything about them. You don’t know their story. We can know that this person wants to be happy just as we do. That they’re vulnerable to pain or loss just as we are and we can wish them well. May you be safe…be happy…be healthy…live with ease. (Pause for 60 seconds) You can call to mind a difficult person, someone who you have trouble getting along with, who’s words or actions are difficult for you, they’re hard to bear in some way. May you be safe…be happy…be healthy…live with ease. (Pause for 30 seconds) If you pick someone like that but find that it’s just too hard to send them loving kindness, then just go back to sending loving
kindness to yourself. In that moment, you’re the one who’s suffering, who’s irritated, who’s annoyed, so you’re quite worthy of some compassion and attention. (Pause for 20 seconds) And then you can offer your well wished, the force of loving kindness, to all beings everywhere – all people, all creatures, all those in existence, known and unknown, near and far. May all beings be safe...be happy...be healthy...live with ease. (Pause for 60 seconds) You can direct the force of loving kindness to all beings in front of you, every form of life (Pause for 15 seconds) and to either side (Pause for 15 seconds) All beings behind you (Pause for 15 seconds) Above (Pause for 15 seconds) and below. May all beings be safe...be happy...be healthy...live with ease. [A bell dings signifying the end of the meditation] And as you go throughout your day of various encounters, conversations, if you’re speaking to someone else see if you can gather your attention and be there to listen. If you meet a stranger, go to the supermarket, you interact with the checkout person, see if you can pay attention to them quite fully wishing for their happiness, their wellbeing just as you would wish for yourself.