An Analysis of the Effects of Mindfulness-based Meditation on Rumination in Anxious Adults

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Abstract

This literature review investigates the link between mindfulness-based meditation, rumination, and anxiety. This examination is attempting to discover how much mindfulness meditation reduces rumination in anxious adults. This literature review defines mindfulness and investigates its effect on mood. Mindfulness-based interventions are examined to determine if they have the capacity to increase dispositional mindfulness. The various types of meditation are defined and compared. Then the link between mindfulness-based interventions and a decrease in rumination is investigated. Rumination as a construct is then examined for its effect on mood and anxiety symptoms in particular. Anxiety disorders, their prevalence in society, and common treatments are explored. These are then compared to the mindfulness-based interventions. Links between all three variables are studied. It is hypothesized that a reduction in rumination is a mediator between mindfulness and a decrease in anxiety. Effect sizes of rumination reported in various studies are compared to give an estimate on the theorized effects of such methods on the reduction of rumination in anxious adults. Although no difference in results were found between different types of meditation, the research does in fact support the notion that through the practice of mindfulness-based meditation one is creating a state of dispositional mindfulness that inherently reduces rumination. Size effects were noted between .34 and .58 (mild to moderate effect). Although no studies investigate all three variables, there is enough evidence to suggest that a similar decrease in rumination should be expected in anxious adults.
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An Analysis of the Effects of Mindfulness-based Meditation on Rumination in Anxious Adults

Anxiety is a common symptom reported by clients who visit a mental health professional for the first time. According to the current Diagnostic and Statistical Manual of Mental Disorders (DSM) (4th ed., text rev.; DSM–IV–TR; American Psychiatric Association, 2000) there exist eleven distinct diagnoses under the category of Anxiety Disorders. Although there are many interventions and modalities of treatment used to treat anxiety disorders, there still exists estimated lifetime prevalence rates ranging from one to thirteen percent depending on the specific disorder (DSM-IV-TR, 2000). It is clear that more exploration and investigation into the treatment of such disorders is necessary. There are many symptoms of anxiety disorders. Although no diagnosing criteria specifically states rumination as a symptom, many list persistent, recurrent thoughts or excessive worry, which rumination has been found to be closely associated (Hughes, Alloy, & Cogswell, 2008).

For the duration of this literature review rumination will be defined as any repetitive, negative, internalized thought process. Rumination is recently being examined as more than just a symptom. Research conducted by Wong and Moulds (2010) suggest that rumination plays a key role in instilling and perpetuating maladaptive self beliefs, a main symptom of social anxiety disorder. Rumination has been linked to negative mood and suggested to be a predictor in relapse (Michalak, Holz, & Teismann, 2011). It is thusly proposed that rumination plays a large part in the formation and retention of mental illness. Addressing and reducing this symptom may be an important part of treating mental illness, particularly in mood and anxiety disorders. Mindfulness-based interventions, particularly that of mindfulness-based meditation, may prove to be a time and cost efficient treatment for anxiety in general and rumination in particular.
Mindfulness-based interventions are becoming a topic of great interest in the mental health community. Most of these treatment programs are conducted in eight weeks or less, require very little resources, are generally administered in a group format, and are thus very time and cost effective. Mindfulness is based on the principle of calming the body and mind while expanding one's awareness. Kabat-Zinn (2002a), an expert in the area of mindfulness states that it can be “operationally defined as the awareness that emerges by way of paying attention on purpose, in the present moment, and non-judgmentally to the unfolding of experience moment by moment” (p. 732). Many studies have presented evidence to suggest that mindfulness-based meditation helps diminish anxiety and depression (Kabat-Zinn, Massion, Kristeller, Peterson, Fletcher, Pbert, Lenderking, & Santorelli, 1992; Michalak, Holz, & Teismann, 2011; Miller, Fletcher, & Kabat-Zinn, 1998). However, little is known about the way in which these techniques produce such changes. In the following literature review this writer will make a case to suggest that one plausible link between such interventions and the decrease in symptoms of anxiety disorders is a decrease in rumination.

The main catalyst for this review comes from the book The Power of Now: A Guide to Spiritual Enlightenment by New York Times Bestseller, Eckhart Tolle. In this book Tolle (1999) describes how one can achieve enlightenment and peace of mind by reorienting oneself in the now and diminishing the ego. One’s internalized voice, derived from the ego, is often termed “the talker”. The talker is the one who continuously speaks in one’s head and proceeds to judge and analyze the world. Throughout the book it is suggested that by meditating and practicing other types of mindfulness exercises one will learn to progressively shut out the talker allowing for a more present-based orientation. It is suggested that this process will lead to great happiness and fulfillment in one’s life and ultimately will lead to the path of spiritual enlightenment.
Although this literature review will not explore the concept of enlightenment, in Buddhist literature the term “enlightenment” implies the breaking of one’s attachments (mental attachments as well as physical attachments) and thus the end of one’s suffering (Chan, 2008). Helping a person break free from the beliefs and behaviors that no longer serve him or her in the attempt to end his or her suffering is certainly one of the aim of all mental health professionals and those who seek such services.

The remaining interest for this topic comes from personal spiritual experience and success with such practices. This writer has practiced and experimented with many types of meditation for the last several years. This practice has lead to a significant decrease in anxiety in general and rumination in particular. This writer is a strong proponent of Adlerian psychology and thus the following analysis contains Adlerian concepts. Results of the following analysis are being interpreted though an Adlerian perspective.

The results and implication of this research have the potential to impact a wide range of individuals and institutions. Mental health therapists as well as mental health institutions working with adults suffering from anxiety may be assisted by the findings of this literature review. An answer to the question of how much mindfulness-based meditation reduces rumination in the anxious adults will provide more support and evidence for plausible interventions for reducing rumination in that population. The research may suggest the use of mindfulness-based meditation practices as an effective way to reduce ruminative thought, which will later be analyzed for its connection to anxiety disorders. This intervention has the potential to be time-limited, implemented in either an individual or group modalities, and be applicable in many settings.
In the following literature review the writer will attempt to ascertain how much the practice of mindfulness-based meditation reduces rumination in adults with anxiety disorders. It is hypothesized that the practice of mindfulness-based meditation will have a moderate effect on the reduction of rumination in the anxious adult population. The following analysis is a compilation of the available scientific studies and literature on the topic using online databases only.

The following review will analyze each component of the research question at hand. Mindfulness-based meditation will be explained in greater detail and compared to similar intervention methods. Mindfulness will then be examined in its relation to rumination. Next rumination and its effects on mood and mental health will be reviewed. The relation between rumination and anxiety will be considered. Anxiety as the dependent variable will be examined for its prevalence in society and common treatment modalities currently in use. The writer will illustrate the types of anxiety and their relation to mindfulness. Finally, all three variables will be examined to find their relation and correlation to one another.

**Mindfulness-based Meditation**

**Defining mindfulness**

For decades psychology as a field has been interested in attention and its effect on one’s mental health, view of the world, and personal development. Mindfulness has emerged as an attention-related construct that is now of great interest to the mental health field. Many techniques have been created for medicinal and therapeutic use. These techniques and programs are based on Buddhist meditation practices. Mayo (2010) states that Buddhism has always taught that mental training through the practice of focusing one’s attention is of vital importance and that such practices have the ability to alter one’s long-term mental state.
These practices were first introduced to the scientific community in 1979 when the Stress Reduction Clinic at the University of Massachusetts Medical Center implemented its mindfulness-based stress reduction program (MBSR) (Williams & Kabat-Zinn, 2011). For the next fifteen to twenty years research on the topic progressed at a slow pace. In the late 1990’s interest skyrocketed. Sanders (2010) composed a literature review examining the use of mindfulness in psychotherapy and found many newer types of therapy that contain large components of mindfulness-based techniques to reach their therapeutic aim. Teasdale and college’s developed a mindfulness-based cognitive behavioral therapy (MCBT) for treating and preventing relapse in those diagnosed with major depression. Linehan developed dialectical behavioral therapy (DBT) for the treatment of borderline personality disorder. Hayes developed an off-shoot of CBT entitled Acceptance and Commitment Therapy (ACT) used to help clients experience the truth of “what is” in contrast to rejecting or denying painful experiences (Sanders, 2010). In 2010 representatives from the National Institute of Health Reported that as an organization they have funded over 150 studies and projects on mindfulness. In the United Kingdom mindfulness-based cognitive therapy (MBCT) has now been mandated as the treatment of choice for those suffering from major depressive disorder (Williams & Kabat-Zinn, 2011).

Mindfulness-based interventions and practices are now being investigated for their use in many fields. With this area becoming so popular it is important for practitioners in particular to familiarize themselves with the concept.

Mindfulness has been described as a state of intentional moment-to-moment awareness of one’s experiences, processed and interpreted in a non-judgmental manner. It is also noted that many definitions of mindfulness include a sense of openheartedness, compassion, friendliness, and curiosity in one’s observations and reactions to the world around them as a part of the
concept of the non-judgmental awareness (Baer, 2011). It is important to note that “Mindfulness can be contrasted with behaving mechanically, or without awareness of one’s actions, in a manner often called “automatic pilot” (p. 245). Teasdale, Segal, Williams, Ridgeway, Soulsby, and Lau (2000) see mindfulness as the true change agent in cognitive behavioral therapy due to its ability to cease the perpetual negative thought cycle and enable the unemotional observation of one’s thoughts. It is assumed that mindfulness is a quality that can be changed and increased over time given training and practice. However, most of the mindfulness questionnaires that aim to measure this quality in a person treat this construct as a consistent, trait-based or dispositional variable that remains constant over time and situations (Baer, 2011). This presents a contradiction as most assessments of this nature are used in research to assess changes over time after the administration of some form of applicable intervention.

In order to properly interpret the results of any study in which assessment measures are used one must have a general understanding of both the construct being assessed as well as the assessment tool being used. The use of mindfulness definitions has lead researchers to identify several aspects of mindfulness that warrant particular attention in the assessment of this construct. This writer has noted two particularly popular and commonly used tools designed to assess mindfulness: the Kentucky Inventory of Mindfulness Skills (KIMS), and the Mindful Attention Awareness Scale (MAAS). The development of the KIMS is based on the idea that Mindfulness is a multifaceted construct that is made up of a number of separate facets or skills (Hansen, Lundh, Homman, & Wangy-Lundh, 2009). “The development of the KIMS led to the identification of four different mindfulness skills: The ability to observe, to describe, to act with awareness, and to accept without judgment” (p. 3). The development of different facets of mindfulness may help mental health professionals identify a client’s current strengths as well as
areas of needed improvement via the construct of mindfulness. It may also assist with the
development of specific interventions geared to improve one particular facet of mindfulness.

“The MASS is a unidimensional measure of mindfulness, which is intended to measure
mindfulness indirectly by asking questions about the opposite of mindful attention and awareness
(such as absentmindedness and lack of attention to the present moment)” (Hansen, Lundh,
Homman, & Wangy-Lundh, 2009, p. 3). Although the two are different approaches to
mindfulness assessment, both are used primarily to measure change over time as they are
generally administered before and after the implementation of an intervention. The KIMS clearly
allows for the analysis of greater information due to the implementation of subscales. However,
these subcategories of mindfulness are relatively new in their development and may or may not
be accepted as true facets of mindfulness by the entire scientific community. The fact that
mindfulness assessments are being used to assess change indicates that the scientific community
believes this to be a non-fixed attribute that has the ability to increase over time. One would not
bother measuring change if the attribute being tested was considered to be a fixed characteristic
such as fingerprints or DNA.

**Increasing Dispositional Mindfulness**

After defining mindfulness it becomes quickly evident that the increase in mindfulness in
daily life would be to anyone’s advantage. The next question to be investigated then becomes,
how does a person increase mindfulness in his or her daily life? Any intervention that leads with
the words “mindfulness-based” can be assumed to do just that, increase the qualities and
behaviors that define mindfulness. Is this true? Does the practice of mindfulness-based
meditation actually affect the facets described in the commonly used mindfulness
questionnaires?
Lykins and Baer (2009) compared scores of 119 meditators and 78 demographically similar non-meditators on the Five Facet Mindfulness Questionnaire (FFMQ), The Depression Anxiety Stress Scales as well as their scores on other self-examination questionnaires. The 119 meditators all reported continuously practicing meditation at least once or twice a week. It is reported that 98% of the meditating participants described their practice as being based in primarily Buddhist practices. Mindfulness-based meditation is constructed on the Buddhist practice of meditation. After controlling for education, age, and those who were mental health professionals, they found that the practice of mindfulness-based meditation is significantly correlated with total reported scores of dispositional mindfulness, as well as four of the five individual facets of mindfulness (Describing, Observing, Nonreactivity, and Nonjudging). They also found that the meditating group scored significantly higher on psychological well-being and significantly lower on measures of mental health symptoms than the non-meditating group (Lykins & Baer, 2009).

This study demonstrates that the practice of mindfulness-based meditation does in fact seem to be positively correlated with measures of well-being. It is important to determine whether other studies found similar results. More examples of this relationship are demonstrated in different sections thought this literature review. Many studies whose primary hypotheses emphasize a different facet of this question also demonstrate the relationship between mindfulness-based practices and an increase in well-being.

**Types of Meditation Compared**

Based on the evidence shown above, as well as the multiple examples to follow, one can conclude with relative certainty that the practice of mindfulness meditation does in fact increase mindfulness and psychological well-being in daily life, but the mechanism which creates these
effects is yet to be fully understood. To better understand this effect it is important to accurately define mindfulness-based meditation and its point of divergence with other meditative and relaxation techniques. There exist many types of meditation and meditative based practices and each has its own identifying characteristics. However, there exist several similar characteristics within each practice. Schoormans and Nyklicek (2011) attempted to better classify the notion of mediation by explaining that

A working definition [of meditation] was formulated by a number of experts in various forms of meditative practice, which involved the following essential elements of meditation as a producer: (1) a defined technique; (2) logic relation (letting go of logical thought); (3) a self-induced state. In addition, some of the following elements may be present: (4) a state of psychophysical relaxation somewhere in the process; (5) a self-focus skill or anchor; (6) an altered state/ mode of consciousness, mystic experience enlightenment or suppression of logical thought processes; (7) embeddedness in a religious/spiritual/philosophical context; or (8) an experience of mental silence. (p. 630)

This definition is meant to be broad and all inclusive. One way to differentiate the types of meditation practices is to classify the practice as either a receptive type or a concentrative type. Receptive types are intended to allow the practitioner to experience an awareness and acceptance of his or her internal and external observations. All stimuli are observed and in a non-judgmental manner. Concentrative meditation involves a more directed attention process which usually involves the use of mantras or individual control of the thought process. Mindfulness-based meditation is usually considered to be a receptive type of meditation.

Schoormans and Nyklicek (2011) conducted a cross-sectional study aimed at examining differences in reported mindfulness and psychological well-being of people practicing two
different types of meditative practices. Convenience samples were obtained of individuals practicing mindfulness-based meditation and those practicing Transcendental Meditation. Participants were asked to complete questionnaires on mindfulness and psychological well-being as well as report the duration and frequency of their meditative practices. Like many studies before, they found a significant positive association between mindfulness and almost all measures of well-being with \( r \) from 0.31-0.59, \( p \leq 0.05 \). However, after controlling for age and sex they found no significant difference between the two groups on any measure of either variable. They did however find that the number of days per week a participant reported practicing had a significant positive effect on both mindfulness and well-being (Schoormans & Nyklicek, 2011). From this study one may begin to doubt whether the type of meditative practice makes a difference. However, it is important to note that the study did not accurately examine two distinctly different types of meditation. Transcendental Meditation, although slightly different than mindfulness-based meditation, is not considered either a purely concentrative or receptive type and instead contains element of both types. Due to the striking number of similarities between Zen and Transcendental Meditation some theorists consider both techniques a form of mindfulness meditation (Ivanovski & Malhi, 2007). This could be the primary reason no difference was seen between either group. A bigger difference may be seen when comparing a purely concentrative type of meditation intervention and a purely receptive type.

A study conducted by Shapiro, Oman, Thoresen, Plante and Flinders (2008) did just that. They randomly assigned 29 undergraduate participants to an eight week MBSR program, Eight Point Program (EPP), or control group. The MBSR program was strongly based on Kabat-Zinn’s MBSR program developed in 1982. The program contained a large portion of mindfulness-based meditation techniques and practices. The EPP program emphasizes a more concentrative
meditation-based technique by encouraging a more focused attention and teaching mantra repetition. Mindfulness was assessed prior to the intervention, post intervention, and eight weeks following the intervention (Exam 1, Exam 2, and Exam 3) using the Mindfulness Attention and Awareness Scale (MAAS). They found that dispositional mindfulness scores improved significantly in both treatment groups from the baseline scores as well as from the control group scores (M = 13.3, P = .004). These improvements are based on the final follow-up at Exam 3 (Shapiro, Oman, Thoresen, Plante, & Flinders, 2008).

Although this study appears to suggest that no type of meditation practice is any less effective at increasing dispositional mindfulness, this writer did notice several similarities in the programs that may be affecting the results. Although both programs were based primarily on the practice of a specific type of meditation, they both also taught and emphasized the widening of one’s attention field which is noted by some mindfulness scales to be a facet of the development of mindfulness as a whole. Both programs included much more than simply the teaching and practice of the meditative technique itself. A literature review conducted by Ivanovski and Malhi (2007) also found that although there exists a proposed classification system identifying types of practices there may not exist any style of meditation that fits purely into one category or another. They found that more often than not most types of meditation included aspects from each category and that most techniques fit somewhere on the continuum between the two categories. However, for the time being it appears there may be something inherent in the practice of any meditation technique that helps bring about a state of mindfulness.

**Effects of Mindfulness on Rumination**

Based on the analysis of the studies above it appears that there is a large body of evidence to suggest that an increase in dispositional mindfulness can be expected in the practice of
mindfulness-based interventions particularly that of mindfulness-based meditation. With this established another facet of the process can be analyzed. What effect does the development of mindfulness or the practice of mindfulness interventions have on rumination? Although a more extensive definition of rumination will be explored later in this review, Nolen-Hoeksema (2000) notes that rumination is a response style characterized by repetitive thinking on negative emotions that often focuses on distressing symptoms. Any form of repetitive thinking cannot be based on the present as the present is constantly changing. It is easy to see how this response style is unhelpful in the cultivation of mindfulness. Sanders (2010) states that the cultivation of mindfulness “leads to a state of mind in which thoughts and feelings are detached from past and future speculations” (p. 19). There are several important components to this statement that demonstrate the contradictions between mindfulness and rumination. In the definition of rumination the focus is on negative feelings. The intended result of mindfulness cultivation is that one begins to experience a detachment from these feelings. Rumination, as stated before, does not allow one to be present-focused. In contrast, the cultivation of mindfulness leads to the aforementioned feeling of being detached from both the past and present. This allows for the ability to notice and feel in the present moment. From this discussion alone one can begin to see the inverse connection between mindfulness and rumination. The analysis of the relationship between mindfulness and rumination can begin with the final information presented in the study above.

In the prior study students were asked to take the 12-item subscale of the Rumination and Reflection Questionnaire designed to measure rumination, as well as the Perceived Stress Scale to measure stress (Shapiro, Oman, Thoresen, Plante, & Flinders, 2008). In their analysis they found that scores on the MAAS significantly mediated decreases in rumination and perceived
stress in both meditative groups (effect size $d = .34$ and .45 respectively). Although the effect size for the decrease in rumination was only considered to be marginal it was noted to be an improvement over measured rumination in the control group (Shapiro, Oman, Thoresen, Plante, & Flinders, 2008). One reason for the small effect size found in this study may be due to the fact that the population tested was not a clinical population. Their base-line scores may already be much lower than that of the clinical population thus their improvements in this area are most likely going to be smaller in proportion. Despite the small size of this noted effect it begins to add weight to the connection between the practices of mindfulness-based meditation interventions and a decrease in rumination. More studies need to be examined to determine a range for this effect size and to establish a better consensus from the scientific community.

A one-month randomized controlled study was conducted to compare the effects of a mindfulness-based meditation intervention and a relaxation-based intervention to a controlled group (Jain, Shapiro, Swanick, Roesch, Mills, Bell, & Schwartz, 2007). The details of this study are highlighted in a later section. Participants filled out the Daily Emotion Report (DER) designed to assess for ruminative and distractive thoughts. Upon analysis they found that participants in the meditation group had post-test scores for distractive thought that were significantly lower than that of the relaxation group ($p < .004$) and control group ($p < .003$). They also demonstrated significantly lower scores for rumination than the relaxation group ($p = .06$) and the control group ($p = .003$). They found that the effect size for rumination was small to medium for the control group and the relaxation group ($d = -.33$, and $d = .30$ respectively) with the effect on the control group noting an inverse relationship. The effect size found for the meditation group was stated to be medium ($d = .57$). It was also noted that changes in rumination scores partially mediated distress scores (Jain et al., 2007). This effect size is much larger than
the one reported in the last study. It is worth noting that although this study was not conducted using a clinical population the participants did score higher on distress scores than the general population which may explain the greater effect size seen (see details in the Anxiety section). Other studies found similar results to the ones found here.

A study conducted by Lykins and Baer (2009) comparing self-reported scores of long-term meditators to non-meditators found that long-term meditators scored lower on many maladaptive characteristics and behaviors (symptoms, cognitive failures, thought suppression, difficulties in emotional regulation, and rumination). They found the most significant mediators to be scores on rumination and scores relating to fear of emotion. The effect size for the decrease in rumination of .58 was measured using a Cohen’s d. “Our findings suggest that decreased rumination and fear of emotion are partially responsible for the relationship between mindfulness in daily life and well-being” (Lykins & Baer, 2009, p. 238). This study has posted the largest size effect for rumination and has built more evidence for the notion that rumination may be an important construct to examine in the context of mindfulness-based interventions. However, it is important to keep in mind that this study contains only a cross-sectional design. No base-line measures exist for the meditative group. Even though the two groups were matched demographically as closely as possible it is still possible that the two populations are in some other way dissimilar causing the results to differ for some unknown reason. The next study examined is experiential in nature and provides a more causally inferred relationship.

Michalak and Teismann (2011) conducted an uncontrolled study examining the effect of an eight-week MBCT program on rumination and relapse in participants with recurrent major depressive disorder in remission. The program included features of CBT as well as components of a MBSR program created by Kabat-Zinn and his colleagues. The twenty four participants
were asked to complete the Ruminative Response Scale (RRS) and the Hamilton Rating Scale for Depression (HRSD) at base-line and directly after the completion of the intervention program. Mean scores on the RRS decrease by 5.75 points, creating a moderate effect size (Cohen’s d = 0.44) on rumination after the completion of the course. Results were significant at p < .05.

Twelve weeks after the completion of the program a Structured Clinical Interview for the DSM-IV (SCID) was administered to determine relapse. During participation in the program none of the participants relapsed. After the completion of the program nine of the twenty four participants relapsed. Post-treatment scores on the RRS were examined using a logical regression analysis and it was determined that higher scores significantly predicted relapse (p<.05). In contrast, reported numbers of previous depressive episodes were not found to be a significant predictor of relapse (Michalak & Teismann, 2011). If rumination is found to be a significant predictor of relapse for those suffering from depression it may also need to be examined as a possible predictor of relapse in those suffering from other mental health disorders. Based on these results, one must wonder if rumination plays a role in maintaining mental health issues. The size effect they found for rumination lands in between the results seen in the last three studies. Although this study lacks a control for comparison, it may supply the most applicable results as this study included a clinical population.

Summary of Mindfulness

In summary, Mindfulness has been defined as a non-judgmental moment to moment awareness that includes qualities of open-minded, open-hearted compassion. Many versions of mindfulness exist in treatment form, most of which include some form of mindfulness-based meditation. The main two types of meditation, concentrative and receptive, have thus far been
shown to generate no statistical difference in effectiveness. However, it has also been argued that no one type of meditation neatly fits into either of the theoretical categories and that all meditation is inherently in some ways mindfulness-based. This research review thus far indicates that dispositional mindfulness can be increased and that this increase generally brings about an increase in well-being. It has also been supported that the practice of mindfulness-based interventions can reduce rumination. Studies in which an effect size was reported primarily indicated a moderate reduction in rumination after the administration of a mindfulness intervention program. Such results were demonstrated in both the clinical and non-clinical populations. These four studies have all pointed to rumination as at least one of the possible change agents in the practice of mindfulness meditation.

**Rumination**

**Defining Rumination**

Baer (2007) defines rumination as “a style of recurrent negative thinking in which the causes, consequences, and implications of negative events and feelings are repetitively analyzed” (p. 240). Whitmer and Gotlib (2012) composed a literature review on the attentional scope of rumination which states that many researchers have broken down rumination into two subtypes: brooding and reflection. Both components share the common factor of being repeated thinking but the brooding concept, which has been noted to be particularly maladaptive, is noted to include moodiness, and reflection is noted to include repetitive thinking about one’s own problems. The reflective component to rumination has yet to be conclusively determined to be adaptive or maladaptive (Whitmer & Gotlib, 2012). For the purposes of this review rumination will be viewed from a holistic stance i.e., no distinction or differentiation will be made between the subcategories of rumination.
In their review Whitmer and Gotlib (2012) also found that trait rumination relates to challenges in updating one’s working memory and separating oneself from, or disregarding, presently irrelevant information. This fact may present a link between the decrease in rumination participants of mindfulness meditation often report. Ivanovski and Malhi (2007) state that although more research on mindfulness meditation is needed that includes a psychiatric population, “mindfulness and Zen meditation techniques have however been shown to result in improved attentional and perceptual processes and to have a direct impact on cognitive processes such as ruminative thinking and autobiographical memory” (p. 88).

The Effects of Ruminations on Mood

As previously noted, many studies have suggested that the practice of mindfulness-based interventions can reduce rumination (Jain et al., 2007; Lykins & Baer, 2009; Michalak & Teismann, 2011; Shapiro, Oman, Thoresen, Plante, & Flinders, 2008). What is the importance of such a reduction? In order to determine the benefits of decreasing rumination, connections between rumination and other aspects of mental health need to be examined.

Harrington and Loffredo (2011) conducted a study of 121 largely female undergraduate students to examine the relationship between various self-focused attention variables and measures of psychological well-being. Participants took several self-assessment measures online including Rumination-Reflection Questionnaire (RRQ), and the Psychological Well-Being Scale. The Psychological Well-Being Scale assesses for six dimensions of well-being: Self-Acceptance, Autonomy, Positive Relations with Others, Purpose in Life, Environmental Mastery, and Personal Growth. Bivariate correlations were determined for all six predictor variables and all seven criterion variables. The resulting analysis found that the rumination portion of the RRQ was significantly negatively correlated with three of the six dimensions of well-being on the
Psychological Well-Being Scale: Autonomy, Environmental Mastery, and Self-Acceptance (p < .001, p < .01, and p < .05 respectively). Although the reason for ruminations relation to these specific aspects of well-being should be examined at greater length these results do suggest that rumination is negatively correlated with aspects of well-being.

Broderick (2005) conducted a study using undergraduate participants to test the effects of two contrasting coping mechanisms on negative and positive mood. In the study a negative mood was induced in participants using the Velten induction procedure. Participants were instructed to engage in one of three experimental tasks: a rumination condition, a distraction condition, or mindfulness meditation condition (the rumination and distraction conditions were created using the protocol designed by Morrow and Nolen-Hoeksema’s, and the mindfulness meditation condition was adapted from a mindfulness meditation recording by Kabat-Zinn). Participants took the Positive and Negative Affect Schedule (PANAS) three times during the study. After undergoing one of three interventions participants were asked to write down what-ever thoughts came to mind. These thoughts were then analyzed by blind raters to fit into the positive, negative, or neutral categories (strong interrater reliability was demonstrated). Distraction was contrasted to rumination as a coping mechanism in which people purposely engaged in thinking or activities that promoted alternative neutral and positive unrelated constructs.

The Results showed that although the distraction group participants demonstrated significantly less dysphoric mood than those in the rumination condition, those in the meditative condition showed significantly less negative mood than both of the previous groups (all results valid at p < .001). Those in the distraction condition as well as the meditative condition showed more neutral thoughts at the conclusion of the experiment compared to those in the ruminative condition. No other significant results were noted (Broderick, 2005). This study helps add weight
to the notion that rumination is less helpful in eliminating and changing negative mood states than both distraction and meditation. It also suggests, as stated previously in this literature review, that meditation has an effect beyond simply distracting participants from their problems.

**The Relation of Rumination to Anxiety**

From the previously outlined research it has become clear that there exists some link between rumination and decreased well-being, or at the very least a sustained decrease in well-being after exposure to distressing stimuli. It has been particularly noted to be related to depressive symptoms (Hughes, Alloy, & Cogswell, 2008). Does rumination play a part in the development of anxiety or anxiety disorders? Watson (2005) studies research on the structural correlations between depression and anxiety disorders and has recently made the suggestion that the two categories be combined in the DSM under what could be called internalizing disorders. It is suggested that it is this internalizing factor that creates the primary symptomatology and is also the major source of distress. The two major internalizing thought processes are generally considered to be worry and rumination. Many have traditionally stated that rumination often plays a significant part in depression where-as worry plays a significant part in anxiety. Are these two types of mental disturbances distinct enough to be subdivided as completely separate symptoms? A study of 364 undergraduate students conducted by Hughes, Alloy, and Cogswell (2008) suggests that the two symptoms are more closely related and intertwined than initially thought.

The researchers aimed to examine the relationship between both rumination and worry on symptoms of depression and anxiety. Students filled out the Beck Depression Inventory (BDI), the State-Trait Anxiety Inventory-Trait Version (STAI-T), the Mood and Anxiety Symptom Questionnaire Short Form (MASQ-SF), the RRS, The Penn State Worry Questionnaire
(PSWQ), the Private Self-Consciousness Scale (PRSC), the Looming Maladaptive Style Questionnaire-Revised (LMSQ-R), The Cognitive Style Questionnaire (CSQ), The Cognition Checklist (CCL), the Future Outlook Inventory, and a demographic questionnaire. Hughes, Alloy, and Cogswell (2008) state that

Rumination and worry were each correlated with the BDI while controlling for the other and gender (partial rs = .46 and .18, ps < .01, respectively). However, rumination was more strongly associated with the BDI than worry ($z = 6.36, p < .008$). Rumination and worry also were each correlated with the STAI-T while controlling for the other and gender (partial rs = .48 and .47, ps < .01, respectively). They were equally strongly associated with the STAI-A ($z = .22$). (p. 279)

These findings suggest that rumination and worry both overlap and contribute to symptoms of depression and anxiety. Almost more important was the finding that in the overlap between anxious and depressive symptoms, rumination plays a much larger role than worry. Rumination was said to be significantly correlated with measures of anxiety symptoms, depressive symptoms, self-consciousness, and cognitions. The researchers suggest that although rumination and worry are both negative processes related to distress, rumination may be experienced as the more distressing repetitive thought process. It was also noted that rumination demonstrated a larger relation to negative cognitions as well as various other symptom measures (Hughes, Alloy, & Cogswell, 2008). This study demonstrates the relevance and need for the examination of rumination in those suffering from anxiety disorders. Based on the findings that rumination might be more distressing than worry, it may point to this dimension as being even more important to assess than other related symptoms.
A study conducted in Sydney, Australia with a group of undergraduate participants demonstrates the link between rumination and three types of maladaptive self-beliefs (Wong & Moulds, 2012). In the study 180 participants filled out several self-assessments (Fear of Negative Evaluation Scale, Social Phobia Scale, Social Interaction Anxiety Scale, Depression Anxiety Scales, Self-Beliefs Related to Social Anxiety Scale, and the Repetitive Thinking Questionnaire) online at Time 1. After a period of one to four weeks (depending on the particular participant’s schedule) each participant re-took the Self-Beliefs Related to Social Anxiety Scale. The average time for the retake was 8.84 days. “Consistent with predictions, trait rumination was significantly and positively associated with Time 2 high standard beliefs (r = .47), Time 2 Conditional beliefs (r = .55), and Time 2 unconditional beliefs (r = .43)” (p. 97). They did not see a significant correlation between rumination at Time 1 and one of the types of maladaptive self-beliefs (high standard beliefs). The results indicate that there is a relationship between a minimum of two types of maladaptive self-beliefs and trait rumination (Wong & Moulds, 2012). The research suggests that the treatment of social anxiety needs to target the ruminative process. This writer proposes that additional research would find that this is also true for other types of anxiety disorders.

Rumination may not only be a symptom to target when treating those with anxiety disorders, it may also be able to predict anxiety symptoms. Nolen-Hoekseman (2000) conducted clinical interviews with 1317 participants in California to test the hypothesis that rumination scores can predict both depression and anxiety. A trained clinician verbally administered the BDI, the Beck Anxiety Inventory (BAI), the Hamilton Rating Scale for Depression (HRSD), the Response Style Questionnaire (RSQ), and the Structured Clinical Interview for DSM-IV (SCID). Using the SCID some of the participants were officially diagnosed with major depressive
disorder. One year later, 1,132 of the participants agreed to a second interview containing the same measures. After analyzing the data they found that before accounting for base-line measures of depression, rumination scores did in fact predict depression (p < .001). However, the inverse is not true. They also found that rumination scores were a good predictor of anxiety symptoms on both occasions (p < .001). In addition, they determined that a group they labeled the mixed depression anxiety group had higher means on the rumination scores Time 1 (M = 51.47) than either the depression only group (M = 47.31) or the anxiety only group (44.06). One major limitation of the study is that there was no measure conducted to determine what type of treatment, if any, participants received between measures (Nolen-Hoekseman, 2000). However, this study adds weight to the notion that rumination is a valid symptom to examine for those experiencing anxiety.

**Summary of Rumination**

Rumination has been defined as a repetitive brooding on negative thoughts, events, or feelings. The research analyzed above has pointed to the fact that rumination is negatively correlated with many measures of well-being and mental health. It has also been established that rumination as a construct is more closely related to worry than initially thought. The two constructs have been found to overlap and both contribute to symptoms of depression and anxiety (Hughes, Alloy, & Cogswell, 2008). Rumination has also been reported to be the more distressing of the two constructs. Due to the fact that rumination has been found to contribute to the development and maintenance of maladaptive self-beliefs treatment for social anxiety disorder in particular should include the reduction of rumination (Wong & Moulds, 2012). There is also evidence to suggest that higher scores on rumination assessments may be a good predictor of both depression and anxiety. The accumulation of the research analyzed in this section adds
considerable weight to the notion that rumination is an important factor to be assessing in those suffering from anxiety and anxiety related-disorders.

**Anxiety**

**Life Time Prevalence**

The research highlighted above begins to shed light on how some mental health symptoms are related. Before examining the shared and unique qualities of anxiety and its relation to the other variables, this writer feels it is important to emphasize the importance of this research by examining the scope and prevalence of anxiety disorders in society. Anxiety disorders are very common and can be debilitating. This prevalence has lead anxiety symptoms to become part of the common vernacular, and in this writer’s opinion, has taken some of the curiosity and research focus away from such disorders. Yet there still exists a great need for better intervention and treatment of anxiety disorders. As noted earlier, the current DSM gives life-time prevalence rates for various anxiety disorders ranging from one percent to fourteen percent (DSM-IV-TR, 2000). A literature review conducted by Somers, Goldner, Waraich, and Hsu (2006) states that the actual international lifetime prevalence rates are most likely much higher. They reviewed five incidence studies and 41 prevalence studies published between the years 1980 and 2004. After compiling the data they found that the one-year prevalence of total anxiety disorders (TAD) was 10.6% (95% Confidence Interval (CI), 7.5% to 14.3%) and the lifetime prevalence was 16.6% (95%CI, 12.7% to 21.1%). They also reported that woman demonstrated a higher rate than men across all anxiety disorders (Somers, Goldner, Waraich & Hsu, 2006). With lifetime prevalence rates as high as they are one begins to wonder about the success rates of the various evidence-based treatment options for this diagnostic category.
Understanding Anxiety

Much of the focus of the exploration of both rumination and mindfulness is currently being undertaken in its relation to depression. Through the examination of several studies it has been established that mindfulness techniques reduce rumination and depressive symptoms. From the research already examined there appears to be a greater link between rumination and anxiety than initially assumed. Rumination, as stated previously, appears to not only occur in those suffering from depressive disorders but it also occurs in those suffering from anxiety disorders. Knowing that anxiety and depression share a great deal of similarities it is important to establish a distinct definition of anxiety in order to better define the main aspects of anxiety disorders. It may then become possible to examine these unique qualities and their relation to mindfulness interventions.

Many people mistakenly understand anxiety as fear. What is the difference between anxiety and fear and how do these definitions relate to anxiety? Barlow defines anxiety as “a future-oriented mood state associated with preparation for possible upcoming negative events, and fear is an alarm response to present or imminent danger (real or perceived)” (as cited in Craske, Rauch, Ursano, Prenoveau, Pine & Zinbarg, 2011, p. 370). In the definition of anxiety listed above there are several components worth noting. First is the notion that anxiety is a mood state where fear is a response. Anxiety is identified as a state of being effecting one’s emotions, not a permanent enduring aspect of one’s very existence. Second, it denotes an attentional base oriented towards the future. This differs from the definition of fear with an attentional basis oriented to the present. It is clear now that anxiety is not fear and vice versa, they simply share characteristics.
The same can be said when looking at depression and anxiety. A tripartite model examines the similarities and differences between fear, anxiety and depression and states that anxiety and depression share many similarities but have a few distinctive qualities. Shared symptoms typically are represented by a negative affect (NA) or general distress factor. Symptoms of anhedonia and the absence of positive affect are specific to depression whereas symptoms of physiological hyper-arousal are specific to “anxiety” (Craske et al., 2010, p. 371). They go on to state that the hyper-arousal seen in anxiety is more a tribute to the somato-viseral symptoms of fear. From this analysis it appears that both depression and anxiety are marked by negative mood and only differentiate in the fact that those suffering from depression have a distinct inability to reach a prolonged state of positive mood and those suffering from anxiety also suffer from the negative effects of perpetual fear. It is important to define both the shared aspects of depression and anxiety because much of the data on the effectiveness of mindfulness techniques has been based on its reduction of depressive symptoms. Finding relations between the two diagnostic categories reinforces the possibility that the same interventions can reduce similar symptomology, and identifying the differences in these diagnoses helps to determine areas for further examination. The area that still needs to be examined is the differentiation aspects of hyper-arousal and the somato-viseral symptoms closely related to fear.

Anxiety Sensitivity

One component that warrants examination is the construct identified as Anxiety sensitivity (AS) which is a dispositional variable defined as the fear of the sensations related to anxiety but is said to be distinctly different from trait anxiety (McKee, Zvolensky, Solomon, Vernstein, & Leen-Feldner, 2007). “AS represents the specific tendency to fear anxiety and other internal symptoms themselves because of the belief that these sensations are personally
harmful” (p. 93). It has been determined that AS as a construct is multifaceted and hierarchal in nature (Naragon-Gainey, 2010). Three factors of AS have been identified: Fear of the physical or somatic sensations experienced while anxious, fear of losing cognitive control or mental capacities, and fear of societal observation of one’s anxiety. AS in general and the aspects defined as the fear of public observation of anxiety and the fear of somatic sensations of anxiety in particular, sound similar to the identified qualities of hyper-arousal and the somato-viseral symptoms that account for some of the main difference between depression and anxiety.

As stated above the lifetime prevalence of anxiety disorders is high. Much of the research on anxiety disorders and anxiety symptoms has focused on the vulnerability, to and continuation of, such symptoms. Keough and Schmidt (2012) state that, “Research has consistently linked anxiety sensitivity (AS), as fear of anxiety related symptoms, to the development and maintenance of anxiety problems” (p. 766). They go on to explain that those who have preexisting mood or anxiety disorders are usually found to have much higher reported levels of AS than that of the general populous. It is also commonly agreed upon that those with a high AS score are at an increased risk for experiencing panic attacks or developing panic disorder (McKee, Zvolensky, Solomon, Vernstein, & Leen-Feldner, 2007). Recently research has been done relating AS to a wide variety of internalizing disorders. Naragon-Gainey (2010) conducted a meta-analysis of various correlational studies relating AS to other disorders. The results showed that, “After shared higher-order variance was controlled, panic, GAD, PTSD, and agoraphobia were most strongly related to AS. Social anxiety and depression had a more moderate relation, and specific phobia had the weakest relation” (p. 143). Olatunji and Wolitzky-Talor (2009) also conducted a meta-analysis examining the relation of AS scores to various anxiety-related disorders. They reviewed 38 studies and found a large effect size to indicate that
participants diagnosed with anxiety disorders have higher AS scores than those of non-clinical control participants. Of the disorders examined they found the greatest levels of AS in those diagnosed with panic disorder and those diagnosed with post traumatic stress disorder. (Olatunji & Wolitzky-Talor, 2009). This research identifies AS as an appropriate and highly correlated construct to be examined in relation to anxiety disorders. What do these results indicate about the relation between anxiety and mindfulness?

A study conducted by McKee, Zvolensky, Solomon, Vernstein, and Leen-Feldner (2007) examines the association between mindfulness scores, negative affectivity, and Anxiety Sensitivity (AS). Using the KIMS, which as discussed earlier examines several aspects of mindfulness, the researchers aimed to determine whether negative affectivity and/or AS are correlated to some of these specific factors. In this correlational study 154 young adults, primarily female, were recruited to take the KIMS, the Positive Affect Negative Affect Schedule (PANAS-NA), and the Anxiety Sensitivity Index (ASI). Results showed a significant negative correlation between negative affectivity and the Acceptance, Act with Awareness, and Describing subscales on the KIMS. They also showed a negative relationship between AS and the Acceptance, and the Awareness subscales on the KIMS. After calculating for shared variance they found that both negative affect and AS had a unique relationship to the Acceptance subscale while only AS had a unique relationship with the Awareness subscale (McKee, Zvolensky, Solomon, Vernstein, & Leen-Feldner, 2007).

There are several important aspects to this study. First, the study reinforces why mindfulness interventions are particularly useful for those experiencing negative affectivity. It suggests that those experiencing negative affectivity are less likely to be able to act in the present moment and be able to describe things happening in the present moment, and are more likely to
evaluate or judge experiences that arise. They are more likely to be stuck in their own internalized thoughts and feelings. As discussed earlier, negative affectivity is particularly evident in those suffering from depression, but it is also commonly seen in those diagnosed with anxiety disorders. This study also demonstrates a specific link between the absence of specific mindfulness criteria and higher scores of AS that were outside of the effect of negative affectivity. This may indicate that those who score high on AS need particular training in the Acting with Awareness and Acceptance aspects of mindfulness. As stated before, AS is highly correlated with anxiety disorders and thought to be a major contributing factor to their development or maintenance of symptoms. Given this relationship and the common areas of mindfulness deficit found in those with high AS scores noted in the previous study, it would be logical to assume that mindfulness-based interventions would aid in treatment of those suffering from anxiety disorders.

**Relaxation and Anxiety**

There have been many interventions and programs suggested for the treatment of anxiety disorders. As with the treatment of many psychological disorders there has been some controversy over whether there is enough evidence to suggest these treatments truly work. The Hawaii Department of Health, Child and Adolescent Mental Health Division (2007) reported that based on empirical research relaxation techniques were found to demonstrate good support for the effective treatment of three behavioral problem categories: anxious or avoidant, depressive or withdrawn, and delinquency or disruptive. How does mindfulness-based meditation compare to relaxation techniques? One study compared the two practices and subsequently measured their effect on participant’s distress, state of mind, rumination, and distraction (Jain et al., 2007).
The study took place over four weeks and consisted of three groups of participants. One group participated in four, ninety minute meditation sessions based on a MBSR model created at the University of Massachusetts Medical Center. The second group participated in a relaxation intervention based primarily on somatic relaxation for the same duration and frequency. The third group was identified as a control. Each participant completed the Brief Symptom Inventory (BSI), Positive States of Mind Scale (PSOM), DER, Index of Core Spiritual Experiences (INSPRIT-R), Marlowe-Crowne (M-C) short form, and a practice log at a minimum of two times (pre-intervention and post-intervention).

The results showed both intervention groups with significant increased positive mood states and significantly decreased distress over time, measured by scores on the BSI, as compared to the control group (all results significant at p < .05). Although no significant difference was found between the relaxation group and the meditation group on scores of positive mood states, they did find that only the meditation group experienced significant decrease in PSOM scores assessing for a variety of positive psychological states. Horowitz, Adler, and Kegeles explain that it is important to note that the PSOM assessment has been consistently demonstrated to be negatively correlated with responses to stressful events as well as measures of anxiety (as cited in Jain et al., 2007, p .14). As previously stated, results showed that the meditation intervention group saw a much larger decrease in both distractive and ruminative thoughts. Although the study was based on students and did not include a clinical population, it is important to note that the students participated in the study during a testing period and as a group tested higher than non-patient adult norms on the GSI. This indicates the participants started the study under distress making the study more applicable for populations already experiencing similar distress (Jain et al., 2007).
The results of this study are important for many reasons. They demonstrate that there are some distinguishing characteristics and treatment properties to meditation programs that exceed the effects of relaxation alone. This study also points to the need for mindfulness-based interventions to be further examined for evidenced-based practice. If relaxation techniques are considered to be successful evidence-based treatment for anxiety and the mindfulness meditation intervention in the last study saw greater results than the already proven method, it stands to reason that the scientific community would want to further investigate the new method. The mindfulness meditation group not only saw an increase in mood states just as the relaxation group did, they also saw a significant decrease in ruminative and distractive thoughts and an increase in positive mind-states. The fact that scores on the PSOM are inversely related to anxiety only serves to greater emphasize why this study is so important and points again to why the mindfulness-based intervention may be superior to the relaxation techniques in reducing anxiety.

**Anxiety and Mindfulness**

It has become evident now that the practice of mindfulness-based meditation and other mindfulness-based interventions help with many aspects of mental health including increased positive mood states and the reduction of rumination. It is also evident from the definition of anxiety given by Craske et al. (2010) stated that the two main components defining anxiety, that of future orientation and temporary mood state, inherently make the argument for interventions that focus on attentional and mood state changes. However, many of the studies previously reviewed were conducted with non-clinical participants or participants meeting a diagnosis of depression alone. Although it has been established from previous analysis that those suffering from depression share many similarities as those suffering from anxiety, one cannot make the
assumption that what works to treat the prior will work the treat the latter. The question then remains: what effect does the practice of mindfulness meditation have on the reduction of anxiety? A few studies have examined this relationship.

To test the relationship between mindfulness-based intervention practice and symptoms of anxiety, a group of researchers gathered twenty-two participants meeting DSM-III-R criteria for panic disorder with or without agoraphobia or generalized anxiety disorder (Kabat-Zinn, Massion, Kristeller, Peterson, Fletcher, Pbert, Lenderking, & Santorelli, 1992). Participants were selected using the Symptoms Checklist 90 (SCL-90-R) and the Medical Symptoms Checklist. Selected participants received their diagnosis based on the Structured Clinical Interview (SCID). Seventeen of the participants were diagnosed with other psychiatric disorders prior to participation in the study, eight with major depressive episode and fourteen others diagnosed with other anxiety disorders. Participants were administered the BAI, BDI, the Hamilton Rating Scale for Anxiety (HAM-A), the Hamilton Rating Scale for Depression (HAM-D), the Fear Survey Schedule, and the Mobility Inventory for Agoraphobia. They were then entered into an eight-week highly structured stress reduction and relaxation program (SR&RP) based heavily on mindfulness meditation. Assessments were given initially and then weekly via phone interview during the intervention period. After the completion of the intervention assessments were given monthly through the third month post-intervention. Pre-intervention scores on both anxiety assessments were all in the moderate to severe range whereas the scores on both depression assessments were in the mild to moderate range.

The mean scores on the four main assessments dropped significantly post-treatment and were maintained thought the follow-up. Mean pre-treatment and post-treatment scores are as follows: 25.86 to 17.10 for the HAM-A, 30.85 to 23.85 for the HAM-D, 20.32 to 7.09 for the
BAI, and 16.18 to 8.18 for the BDI (all scores valid at \( p < .001 \)). A significant percentage drop can be noted in most scoring categories (34%, 23%, 65%, and 49% respectively). They also saw a statistically significant decrease in the number of panic attacks reported from pre-treatment to post-treatment. These results also continued through the follow-up. No statically significant data outcomes were found between participants diagnosed with panic disorder with or without agoraphobia, generalized anxiety disorder, or major depressive episode. Participants enrolled in the SR&RP who met the initial criteria for the study but who were not selected to be full participants, were administered the SCL-90-R and the Medical Symptoms Check list both pretreatment and post treatment. This group showed statistically significant improvements comparable to that of the full participation group. This adds support to the notion that the results cannot be attributed solely to participation in a study and that results may also be generalizable to a wider group of patients with varying psychiatric diagnoses. Upon further analysis they found that that no demographic, base line variables, expectancy ratings, or self-reported amount of practice were significant predictors of outcome (Kabat-Zinn et al., 1992).

This study adds evidence to the notion that the practice of mindfulness-based interventions does in fact produce a reduction in anxiety symptoms. What makes this study even more valuable is that a follow-up was conducted three years after the completion of the initial study. Eighteen of the former twenty-two participants agreed to complete the same battery of assessments used three years prior (Miller, Fletcher, & Kabat-Zinn, 1998). To build better evidence for the generalizability of the study 39 of the 58 non-study participants were contacted and also repeated assessment measures to be compared with prior results. During the follow-up ten of the original twenty-two participants stated that they continued to participate in a formal meditation practice of their own accord. Analysis showed that all statistically significant result
outcomes seen in the prior study were maintained at the three-year mark. The decrease in severity and number of reported panic attacks was also maintained. It is interesting to note that eight of the eighteen original full participants did not receive any further treatment of any kind for anxiety symptoms following the SR&RP (Miller, Fletcher, & Kabat-Zinn, 1998). The fact that participants were still experiencing benefits from the intervention after three years adds weight to the power of such interventions. This suggests that such interventions may in fact be addressing a root cause of such disorders and are doing more than just serving to mask symptoms or bring temporary relief. The next study helped to further identify those aspects inherent in the mindfulness-based meditation process that may be aiding in this mental health transformation.

A study conducted by Rasmussen and Pidgeon (2011) examined the relationship between mindfulness, self-esteem, and social anxiety. They hypothesized that dispositional mindfulness indirectly forecasted lower social anxiety though an increase in self-esteem. 205 undergraduate students from Australia completed the Mindful Attention Awareness Scale (MAAS), The Rosenberg Self-Esteem Scale, and The Social Interaction Anxiety Scale. As previously predicted, the results demonstrated that mindfulness was positively correlated to the student’s measures of self-esteem. They also found that self-esteem and mindfulness were both negatively correlated with social anxiety scores. Using hierarchical and linear regression procedures they discovered that “The results of the analysis supported the primary hypothesis: higher levels of mindfulness significantly predicted lower levels of social anxiety, and this effect was partially enhanced by the significant positive effect of mindfulness on self-esteem” (Rasmussen & Pidgeon, 2011, p. 231). The conclusion of the research suggests that practice of mindfulness-based meditation increases one’s self-esteem and thus decreases social anxiety.
Summary of Anxiety

Anxiety is a symptom that affects a great number of people worldwide. Lifetime prevalence rates are reported to be as high as 16 percent (Somers, Goldner, Waraich & Hsu, 2006). Anxiety as a concept shares similar components to depression but is distinct in that it includes a hyper-arousal and somato-viseral symptoms associated with fear (Craske et. al., 2011). AS as a construct may account for some of the distinct attributes differentiating anxiety disorders from depressive disorders. Increased rates of AS have been found to be linked to the development and maintenance of trait anxiety, which may explain why those with mood or anxiety disorders have higher AS scores than the general population (Keough & Schmidt, 2012). It has also been reported that AS negatively correlates to specific aspects of mindfulness indicating that those suffering from anxiety may already have a deficit in specific mindfulness skills and would benefit from interventions that target these areas. Mindfulness techniques appear to be even more effective in increasing measures of positive mood and decreasing distractive and ruminative thoughts for this population than relaxation techniques. Based on the studies examined above there appears to be good evidence to suggest that mindfulness-based interventions, including some form of mindfulness-based meditation, is successful at reducing anxiety symptoms. Evidence was also presented to support the notion that such results have a lasting effect (Miller, Fletcher, & Kabat-Zinn, 1998). Finally, evidence was presented that demonstrated a negative correlation between mindfulness and self-esteem. Lower levels of mindfulness were found to predict lower levels of self-esteem and social anxiety. This researcher surmises that the increase in self-esteem is related to the decrease in rumination and that reducing rumination is in fact the true change agent that ultimately reduces anxiety.
Mindfulness, Rumination, and Anxiety

Each variable has been analyzed concerning its relation to each of the other variables. Many studies presented above included two of the three identified variables and the analysis of such studies has aided the inductive reasoning process that produces the conclusion this literature review is intended to make. Although no study was found containing all three variables with the amount of specificity this author would have liked (namely a scientific study containing measures of anxiety, rumination, and mindfulness on a clinical adult population before and after a mindfulness meditation based intervention). However, the following study contains most of these variables and nicely summarizes the proposed moderating effects researched in this literature review. A correlational study conducted by Marks, Sobanski, and Hine (2010) was conducted to test the hypothesis that both mindfulness and rumination moderate the relationship between measures of life hassles and various measures of mental health in adolescence. The study was conducted using 317 Australian students ranging from ages 14-19. All participants took several self report measures: The Inventory of High-School Students’ Recent Life Experiences (IHSSRLE), the Ruminative Thoughts Style Questionnaire, The Mindfulness Attention Awareness Scale, and The Depression Anxiety Stress Scales-21 (DASS-21).

In their analysis they found age and sex to be significant correlates to particular variables, consequently they were entered as covariates in all further analysis. They found mindfulness and rumination to be significantly negatively correlated. Regression analyses found rumination to explain a significant amount of the variance of reported scores in anxiety, depression, and stress (40%, 49%, and 55% respectively). Mindfulness was also found to explain a significant amount of the variance of reported scores in anxiety, depression, and stress (38%, 49%, and 56% respectively). All of the results reported here were found valid at \( p < .01 \). After controlling for
covariates and scores on the IHSSRLE, a measure of recent life hassles, they found “dispositional rumination exacerbated the relationship between life hassles and symptoms of depression and anxiety” (Marks, Sobanski, & Hine, 2010, p. 835) Although they did not find significant results suggesting the same for the relationship between life hassles, rumination, and stress levels it is important to note that the results tended in the expected direction. In contrast to rumination they found that mindfulness mitigates the relationship between the same scores of life hassles and all three mental health variables: depression, anxiety, and stress. They then propose that preferred cooping style, particularly that of either rumination or mindfulness, may explain a majority of the reason that some adolescents cope with life hassles and some do not (Marks, Sobanski, & Hine, 2010).

As indicated much earlier in this review, both rumination and mindfulness can be viewed as coping mechanisms. They are a way of dealing with the world. It appears that from the previous study rumination and mindfulness are in some way contrasting and opposing constructs. From the research studied thus far it appears that those who score high on mindfulness thus score low on rumination and vice versa. They each appear to have an effect on mental health and well-being; rumination decreases well-being where as mindfulness has been shown to increase measures of well-being. It appears that by increasing mindfulness one can reduce one’s rumination and thus increase measures of well-being. This is the original finding proposed by this literature review.

Although the study above highlighted and summarized the effects of rumination and mindfulness that has been demonstrated in many other studies, it is important to keep in mind that the population studied was adolescents. Due to the large amount of evidence already suggesting this relationship one might expect to see these same results if the study was
conducted using adults; however, until such a study is conducted one cannot confidently make this assumption. This study, just like most studies reviewed in this study, did not include participants from a clinical population making the results hard to translate for that population; however, it is important to note that a fair percentage of the population assessed above did, according to clinical norms of the DASS, score in the severe range for depression, anxiety, and stress (14%, 20%, and 14% respectively). The other studies examined in this review that did include the clinical population of interest, those suffering from anxiety disorders, employed the independent variable of mindfulness meditation but did not test for any measure of rumination. The resulting analysis then must make logical assumptions based on similar scientific evidence gained from a variety of sources.

What is clear thus far is that based on the accumulation of evidence from a variety of studies, mindfulness-based meditation appears to increase a person’s state of dispositional mindfulness as well as general well-being (Lykins & Baer, 2009; Schoormans and Nyklicek, 2011; Shapiro, Oman, Thoresen, Plante, & Flinders, 2008). There is a large amount of evidence available to suggest that such intervention also decreases anxiety and depression (Kabat-Zinn et al., 1992; Michalak & Teismann 2011; Miller, Fletcher, & Kabat-Zinn, 1998). During a few of these studies researchers have examined the link between mindfulness and rumination. There is evidence to suggest that the practice of mindfulness-based interventions can help one reduce rumination (Jain et al., 2007; Lykins & Baer, 2009; Michalak & Teismann, 2011; Shapiro, Oman, Thoresen, Plante, & Flinders, 2008). Rumination has been negatively linked to measures of well-being and self-esteem, both of which have some relation to the development or maintenance of anxiety disorders (Harrington & Loffredo, 2011; Rasmussen & Pidgeon, 2011). Rumination also appears to be closely related to worry, another symptom experienced by those
suffering from anxiety disorders (Hughes, Alloy, & Cogswell, 2008). Rumination has been suggested to be an important symptom to target in order to reduce overall anxiety.

Because both anxiety and rumination appear to be reduced by the practice of mindfulness interventions, and the fact that rumination is suggested to be related to the development and maintenance of anxiety symptoms, it seems to follow that just like the general population, the anxious adult population would show the same reduction in rumination by practicing such interventions. The size effect of such a decrease has been noted to be .38, .44, .57 and .58 on the four studies examined above. All but one of these results was noted to be of moderate effect size. Although none of these studies included the clinical population in question other studies using such populations, or those at least demonstrating a higher than average distress, have added weight to the notion that such interventions produce similar effects in the clinical population as well. Based on the evidence presented thus far, it is this writer’s opinion that similar results can be expected in a clinical population. This writer believes that a moderate decrease in rumination can be expected when using mindfulness-based meditation intervention with adults suffering from anxiety disorders.

**An Adlerian Analysis**

Apart from determining the effect size of the decrease in rumination due to the implementation of a mindfulness-based meditation, the purpose of this paper is to increase the general body of knowledge for improving mental health in society. Based on the research reviewed above it appears there is a large body of evidence that demonstrates that mindfulness-based interventions help improve well-being and decrease mental health symptoms in a variety of clinical and non-clinical populations. The question now being investigated is: why do mindfulness-based mediation techniques work to improve the lives of those who practice them?
The noted decrease in rumination is one suggested answer proposed by this literature review. However, the concept of rumination apart from causing distress, may be linked to other concepts of mental illness. These concepts can be explained using an Adlerian perspective.

**Private logic verses Common Sense**

Individual psychology, often termed Adlerian psychology developed after Alfred Adler split from the Freud’s psychoanalytic society (Mosak & Maniaci, 1999). The two worked together for many years until their divergent thinking forced them to part ways. Alfred Adler “believed that three main components were common to all psychopathology: discouragement, faulty conceptions, and lifestyle beliefs” (Carlson & Sperry, 1996, p. 5). The Adlerian view of neurosis begins with the development of mistaken beliefs that lead to a mistaken style of life. Individual psychology is based on the notion that all individuals perceive the world in his or her own unique manner. These experiences and perceptions are used to give meaning to one’s reality. This meaning is all one’s own and is considered one’s private logic or private intelligence (Ansbacher & Ansbacher, 1956). This is in contradiction to the meaning that all of society gives any one thing often referred to as common sense. Griffith and Powers (2007) state that private intelligence “describes the fictional line of reasoning proceeding from private meaning, that is, meaning premised upon the person’s private and unique valuation of self, others, and the world, and what life requires of him or her” (p. 81).

This “line of reasoning” is stated to be fictional because no person possesses the ability to see pure truth in the world. It is often understood that each person can only take in the world with his or her own senses. Not only does this leave out information that one has no ability to perceive but it also inherently creates bias in one’s interpretation. However, it is necessary for each individual to establish certain understandings of the events and interactions in his or her world in
order to establish an internal general guideline of how to act and react. This subconsciously chosen way to act and react in the world is termed one’s style of life or lifestyle (Adler, 1980). It is designed to incorporate one’s private logic and many mistaken beliefs. In his writings Adler suggests that the more rigid and further deviated one private logic is from the common sense the less one can communicate, understand, and connect with his fellow man (Ansbacher & Ansbacher, 1956). This communication with one’s fellow man is extremely important as no human can exist in isolation. This is a central premise of Adlerian theory and it is considered one of the basic principles of human behavior.

Social Striving

Adler asserted the fact that there has been no identifiable case of a human existing outside society without the aid of others or the creations of others (Adler, 1957). He continued by stating that humans are inherently weak animals who do not by nature have the capacity to survive in the world alone. “One must remember that every child occupies an inferior position in life; were it not for a certain quantum of social feeling on the part of his family he would incapable of independent existence” (Adler, 1957, p. 65). The need for social interest and community feeling begins here with each human’s recognition of inferiority to his or her environment. In his or her attempt to make a place for himself or herself in the world every individual strives for superiority (Ansbacher & Ansbacher, 1956). It is his or her way of striving in the world that makes up his or her character, style of life, and mental health. Adler differentiates normal striving from abnormal striving by stating that the, “neurotic is more concerned with his self-esteem, and has a personal goal of superiority, the normal individual, due to his greater social interest, is more concerned with gaining satisfaction by overcoming difficulties which are appreciated as such by others” (p.102). The self or others focus of one’s
striving makes a large difference in one’s mental health. It is often understood that the greater degree of social interest or community feeling one has the more mentally healthy the individual (Ansbacher & Ansbacher, 1956). In order to increase the measure of positive mental health a mental health professional must understand the concept of community feeling, be able to identify when one is lacking in community feeling, and be able to implement interventions that increase community feeling.

Griffith and Powers (1987) describe community feeling as both a person’s awareness of belonging to one’s community and environment as well as one’s understanding of the inherent responsibility to operate within the community in a way that promotes and maintains this connection. Inherent in this definition is the idea that one understands how his or her actions affect the group as a whole. When a person is lacking in community feeling or social interest, he or she attempts to gain a sense of superiority while still actively avoiding solving any of his or her problems (Adler, 1980). When confronted with life tasks they feel they cannot meet, or where the aforementioned beliefs are challenged, the individual will unconsciously resort to various forms of abnormal behavior to safeguard his self-esteem (Ansbacher & Ansbacher, 1956). It is these behaviors that bring individuals to seek mental health treatment. When an individual regains health and is able to increase his or her community feeling, “he does not lag behind and become a liability for his fellow man; he does not need or demand special consideration; but he proceeds with courage and independence to solve his problems in accordance with social feeling” (Adler, 1980, p. 57). How can this capacity for community feeling be increased?
Relation to Mindfulness and Rumination

Mindfulness meditation may be an applicable intervention in helping increase one’s community feeling as well as in reducing the private logic that inhibits it. How does rumination and mindfulness relate to private logic and community feeling? Rumination has been identified as a coping mechanism in which one repeatedly focuses on negative thoughts or emotions. It is commonly understood that the more an action or thought pattern is repeated the more imbedded it becomes in the mind. The neurological pathways are thus continually being reinforced. This also holds true for the way each individual views his or her private world. The more this thought pattern or private logic is engaged the more it gets rooted in the mind. Rumination may be understood as a way to establish on and solidify one’s private logic. This private logic, although important for the foundation of one’s initial ability to cope in the world, becomes detrimental later in life.

This concept is similar to the notion of private self-consciousness. Private self-consciousness, as noted by Harrington and Loffredo (2011) is described as a person’s tendency to focus primarily on one’s inner feelings and thoughts. Apart from having a few positive personality correlations, private self-consciousness has been negatively linked to the presence of such characteristics as neuroticism, anxiety, and depression. They continue by stating that this notion of private self-consciousness has been divided into two subcategories representing opposing facets: Internal self-awareness (ISA) which is the tendency to continually be aware of one’s own feelings as well as mental processes, and self-reflectiveness (SR) which is defined as a person’s tendency to repeatedly focus on one’s self. While there appears to be a positive correlation between ISA and psychological well-being, high SR scores are associated with low self-esteem, neuroticism, depression, trait anxiety, social anxiety, and excessive rumination.
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(Harrington & Loffredo, 2011). This notion of repetitive self-focus is clearly not beneficial to one’s psychological well-being. If one continually ruminates on the negative aspects of one’s life it perpetuates feelings of inferiority which, as noted earlier can lead an individual to display abnormal behavior in an attempt to safeguard his or her self-esteem.

To help someone change his or her overall all mental well-being one must help him or her gain awareness of the thoughts that are not based in common sense and thus hinder communication and connection with one’s community. This awareness is not only a large part of the definition of mindfulness, it is also a concept taught in many mindfulness-based intervention programs (Kabat-Zinn, 2002b). Mindfulness is often considered a state of nonjudgmental awareness. In an Adlerian interpretation this may imply a state in which one is attempting to not engage in, or to disregard, one’s private logic. Once one becomes aware of his or her private logic one can challenge it. Mindfulness may prove to be a method to help assist one with both the awareness of one’s private logic, disengaging from it.

Awareness of one’s private logic could be built though the process of noticing and being aware of the thoughts as well the corresponding sensations that arise during mindfulness meditation. When one is engaging in an automatic thought there exists very little room for choice. When one is made aware of his or her private logic he or she is now afforded the choice of engaging or disengaging these thoughts. Through this process one can see how an individual may become aware of his or her private logic as well as begin to disengage from it. By decreasing ones private logic it affords one the opportunity to choose to engage in the common sense view instead. This increases common understanding in the world and this in and of its self may increase one’s sense of community feeling. The definition of community feeling includes one’s awareness and understanding of how his or her actions are a part of something larger.
Kabat-Zinn (2002b) explains that through “observing the moment-to-moment unfolding of bare sensation in the body, over time, the pain might diminish, sometimes quite dramatically. Or, they might find new ways to expand their repertoire of strategies for living with it more effectively” (p. 70). One can begin to notice and disengage from those behaviors and thoughts that once caused him or her to seek a sense of superiority without actively participating in problem-solving. By doing so one may be able to find relief and possibly a new way of looking at the world.

Another aspect of this awareness is that it can help teach a person to have more control over their attention. It helps them move his or her awareness from his or her internal world to the external world around him or her. Kabat-Zinn (2002b) explains that through the process of mindfulness-based meditation one can become less reactive and agitated by becoming focused on the present moment. With this new awareness one is more readily able to engage in the world around him or her thus developing more community feeling. Griffith and Powers (2007) summarize this movement by stating that

The more developed the community feeling, the more diminished the inferiority feeling with its associated sense of alienation and isolation: therefore, the effectiveness of psychotherapy or counseling depends upon increasing and strengthening the discouraged person’s community feeling and social interest. (p. 11)

Mindfulness-based meditative practices appear to include the necessary components to teach and enhance community feeling. In the nonjudgmental portion of the mindfulness definition it is common to see a reference to open-hearted, compassionate, open-minded acceptance. Shapiro, Oman, Thoresen, Plante and Flinders (2008) state that, “MSRB explicitly encourages cultivation of loving kindness” (p. 847).
Summary of Adlerian Analysis

The guiding principles and constructs of Adlerian psychology have been explained and related to the topic at hand. The development and impact of private logic was explained and contrasted to the concept of common sense. Rumination as a concept has been linked to the notion and perpetuation of private logic. The importance of community feeling and social interest as a measure of mental health was highlighted. Similarities were found between the concept of community feeling and many aspects of mindfulness. The conclusive analogy this writer is making is that rumination is a way to sustain private logic which sustains inferiority feelings and diminishes community feeling. The practice of mindfulness-based meditation can be viewed as a way to decrease the repetition of such private logic, diminishing inferiority feelings, and increase those aspects that create community feeling.

Discussion

From the prior analysis it has become clear that there is evidence that mindfulness-based meditation increases dispositional mindfulness (Lykins & Baer, 2009; Shapiro, Oman, Thorsen, Plante, & Flinders, 2008). This type of intervention also has been demonstrated to increase measures of psychological well-being (Lykins & Baer, 2009; Schoormans & Nyklicek, 2011). Much of the initial clinical research on the benefits of mindfulness-based interventions was conducted on those suffering from depression. However, there exists a fair amount of scientific evidence promoting the successful use of mindfulness-based interventions for those suffering from anxiety. Several studies demonstrated that the practice of mindfulness-based interventions decrease anxiety symptoms (Kabat-Zinn et al., 1992). The large body of evidence supporting these claims has allowed much of this information to be accepted by the scientific community. This does not mean that the study of mindfulness-based meditation is complete. There are still
several questions left unanswered, one of the most important of which concerns how this intervention produces its effects. This literature review proposes that a decrease in rumination is partially responsible for the effectiveness of mindfulness-based meditation.

Scientific evidence suggests that the practice of mindfulness-based meditation or involvement in programs based upon this intervention most commonly produces a moderate decreases in rumination (Jain et al., 2007; Lykins & Baer, 2009; Michalak & Teismann, 2011; Shapiro, Oman, Thoresen, Plante, & Flinders, 2008). This decrease has been noted as a mediating effect between dispositional mindfulness intervention and well-being. Not only are the constructs of depression and anxiety closely related, rumination has also been found to be highly correlated with worry, a construct usually associated with those suffering from anxiety (Craske et. al., 2010; Hughes, Alloy, & Cogswell, 2008). Rumination was found to be not only a predictor of depression but also a predictor of anxiety (Nolen-Hoekseman, 2000). Through this literature review rumination has been shown to be a valid construct to explore with those suffering from anxiety disorders. Rumination was also found to be negatively correlated with measures of self-esteem (Rasmussen & Pidgeon, 2011). Mindfulness was found to have an inverse relationship with self-esteem. It was also determined that self-esteem and mindfulness were both negatively correlated with social anxiety scores (Rasmussen & Pidgeon, 2011).

Much of this research has been conducted on either the nonclinical or clinically depressed populations. However, based on the variety of evidence presented above, there is reason to believe this same decrease in rumination would be observed in the anxious adult population. More studies using the anxious adult population are needed in order to determine the true level of the decrease in rumination that would be seen preceding the practice of mindfulness-based meditation. This writer believes that the decrease in depression and anxiety as
well as the increase in self-esteem and well-being measures observed in those who have practiced mindfulness-based meditation interventions is in part due to the decrease in rumination.

Based on the effect sizes presented in the studies that examined both mindfulness and rumination, it appears that this decrease is moderate, ranging from .38-.58. More is needed to determine what other variables are influencing the success of mindfulness-based meditation.

Upon comparing mindfulness-based meditation to other similar meditation-based interventions there appears to be no statistically significant difference in effectiveness. All meditation-based interventions appear to increase dispositional mindfulness. There may be a common factor involved in the practice of meditation in general, such as widening one’s attentional field and slowing down reactivity, which accounts for this effect. More research into the similarities and differences between various types of meditation is necessary to better understand this effect. Most interventions examined in this review were stated to be eight weeks in duration. However, a few studies conducted an intervention in a shorter time period and still saw similar results. Several studies noted the effect of duration and frequency of meditation as having an effect on self-reported questionnaire results. More studies are needed to further examine this effect and to determine the most time-effective and time-efficient duration to administer such an intervention. There is good evidence to suggest that mindfulness intervention programs are effective treatments at bringing about change in several dimensions. The effects of which have been scientifically shown, in the clinical population, to last several years at a minimum (Miller, Fletcher, & Kabat-Zinn, 1998). This intervention is time and resource-efficient and should be studied for the treatment of more clinical populations as well as for ways to integrate it with already established treatment programs.
References


